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

PROPOSALS FOR AMENDMENT OF APPENDICES I AND II FOR CONSIDERATION BY THE NINTH MEETING OF THE CONFERENCE OF THE PARTIES

Rome, 1-5 December 2008

Index

APPENDIX II

Appendix I

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

A. PROPOSAL: Inclusion of *Tursiops truncatus ponticus*, population of the Black Sea, on Appendix I

B. PROPONENT: Government of Monaco

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Delphinidae
1.4	**Species**	*Tursiops truncatus ponticus,* Barabasch, 1940
1.5	**Common name(s)**	English: Bottlenose dolphin, common bottlenose dolphin Spanish: Delfín mular French: Grand dauphin

2. Biological data

Two main researchers described Black Sea cetacean morphology (body and skull size) and compared their results with published data from other oceans (Barabash-Nikiforov 1940 and 1960, Kleinenberg 1956). Although those studies used a large number of specimens, they led to opposite conclusions concerning the morphological uniqueness of Black Sea bottlenose dolphins. Barabash-Nikiforov (1940) went so far as to suggest that the Black Sea bottlenose dolphins constitute a separate subspecies: *Tursiops truncatus ponticus*. More recently, a worldwide study on bottlenose dolphin genetic patterns, which included some Black Sea samples, suggested the isolation of the Black Sea population from Mediterranean populations (Natoli *et al.* 2003). For CITES (2000, 2002) due to the low sample size from the Black Sea, the study could not conclude that Black Sea bottlenose dolphins are genetically unique. However, in 2003, the IWC Scientific Committee's Sub-Committee on Small Cetaceans reviewed the status of Black Sea bottlenose dolphins and concluded on the base of new genetic data that this population should be managed for conservation as a distinct entity (IWC 2004). Later on, it was shown that the Black Sea population is distinctly differentiated genetically from other bottlenose dolphin populations in the eastern and western Mediterranean and the northeastern Atlantic (Natoli *et al*. 2005; Viaud-Martinez *et al*., 2008), and this evidence supports recognition of a valid subspecies, *Tursiops truncatus ponticus* Barabasch, 1940 (Reeves and Notarbartolo di Sciara 2006).

The subspecies *Tursiops truncatus ponticus* is endemic to the Black Sea and isolated from other populations of bottlenose dolphins in the Mediterranean and other waters (*e.g.,* Tomilin, 1957; Rice, 1998; Natoli *et al*. 2005; Viaud-Martinez *et al*., 2008).

2.1 Distribution

The bottlenose dolphin (*Tursiops truncatus*) is distributed worldwide in temperate and tropical waters (Wells and Scott, 1999).

The range of Black Sea bottlenose dolphins includes the Black Sea proper; Kerch Strait along with the adjoining part of the Azov Sea; and, obviously, the Turkish Straits System including the Bosphorus and Dardanelles Straits, and the Sea of Marmara. The genetic data suggest that the TSS constitutes an ecological barrier between the Black Sea dolphins and those in the Mediterranean, although limited gene flow between the two seas is probable (Natoli *et al*. 2005; Viaud-Martinez *et al*., 2008).

2.2 Population

During most of the 20th century, the bottlenose dolphin was considered the least abundant of the three cetacean species in the Black Sea (Kleinenberg 1956; Geptner *et al.* 1976; Yaskin and Yukhov 1997). However, the total population size in the Black Sea remains unknown. Region-wide estimates of absolute abundance, based on strip transect surveys carried out in the USSR (1967-1974) and Turkey (1987), have been discredited by the IWC Scientific Committee due to irremediable methodological and interpretive problems (Smith 1982; Buckland *et al.* 1992). Rough indirect estimates of abundance from more recent (1997-2005) line transect surveys in different but quite small parts of the Black Sea suggest present population size of several 1000s (Reeves and Notarbartolo di Sciara 2006).

It is thought that overall abundance of dolphins in the Black Sea has declined greatly due to severe over-exploitation up into the 1980s by riparian nations. A very large purse-seine fishery conducted by the USSR, Bulgaria and Romania collapsed in the 1960s due to over harvesting, and large takes by rifle continued by Turkey until a ban in 1983 and possibly subsequent years (Zemsky, 1996; Çelikkale et al., 1988; Buckland *et al*., 1992; Yel *et al*., 1996). The proportions of the three endemic small cetaceans (bottlenose dolphin, harbour porpoise (*Phocoena phocoena relicta*) and long-beaked common dolphin (*Delphinus delphis ponticus*) in these catches and their relative degrees of depletion is not known with confidence. Besides, no estimates exist of sustainable levels of take. Thus any take for purposes of exhibit or export are potentially detrimental to the status of the population.

Because no reliable population trend data are available, harvest figures are used as a population trend indicator. Harvest of small cetaceans of three species in the purse-seine fishery were in the tens of thousands annually and exceeded 100.000 in some years, followed by collapse of the fishery in the 1960s (Zemsky, 1996) although catches continued in Turkey (Yel *et al*., 1996). In the 20th century in the former Russian empire and then in the USSR the number of Black Sea cetaceans killed and processed undoubtedly exceeded 1.5 million animals of all three species, while other Black Sea states together probably killed about four or five million (Birkun *et al.,* 1992; Birkun and Krivokhizhin, 1996 and Birkun, 2002a).

It is suspected that during the period following the ban against cetacean fishery in the Black Sea region (1983-2008), the population had a tendency to increase; however, it is also suspected that recovery was compromised by a mortality event in 1990 and is continuing to be compromised by persistent and probably increasing anthropogenic influences (Reeves and Notarbartolo di Sciara 2006; see “Threat data” below).

2.3 Habitat

A coastal habitat seems to be preferred in the Black Sea, with occasional movements into offshore waters (Reyes, 1991; Yaskin and Yukhov 1997). In the northern Black Sea bottlenose dolphins form scattered communities of some tens to approximately 150 animals in different places around Crimea, including the Kerch Strait and coastal waters off the western and southern extremities of the peninsula (Zatevakhin and Bel'kovich 1996; Birkun 2006). Accumulations also are known to form off the Russian Caucasus and close to the Turkish coast. Bottlenose dolphins typically aggregate during cold season (late autumn, winter and spring) in a relatively small area off southern Crimea between Cape Sarych and Cape Khersones (Birkun 2006). There are a few records of bottlenose dolphins entering Black Sea rivers, e.g. the Danube in Romania (Police 1930, *fide* Tomilin 1957) and the Dnieper in Ukraine (Birkun 2006).

Limits to the species' range appear to be temperature related, either directly or indirectly through distribution of prey. Bottlenose dolphins are primarily piscivorous in the Black Sea, taking both benthic and pelagic fishes, large and small. A total of 16 fish species have been reported as prey off the Crimean and Caucasian coasts (Kleinenberg 1956; Tomilin 1957; Krivokhizhin *et al.* 2000) including four species of mullet (*Lisa aurata, L. saliens, Mugil cephalus* and *M. so-iuy*).

2.4 Migrations

Herd migrations (sometimes of several hundred animals) are known along the south coast of the Crimea in autumn (Birkun, 2006), but migratory routes should be studied much more thoroughly, including, in particular, the Turkish straits system - the single path for probable genetic exchange between Black Sea and Mediterranean Sea populations. The Kerch Strait and the Bosphorus, and contiguous waters are the most critical places for cetacean movements and sedentary habitation because of strong local anthropogenic pressure caused by various "beneficial" activities. Studies of human activities within the Turkish straight system suggest that historically low levels of movement between the Black Sea and the Mediterranean Sea may have further decreased in the past 100 years, although we cannot estimate these parameters with data.

Coalescent estimates of migration between the Black Sea and the Mediterranean Sea were between 1 and 10 individuals per generation, representing low movement of individuals between the two seas (Natoli *et al*. 2005; Viaud-Martinez *et al*., 2008). Overall, bottlenose dolphins historically moved little between the Mediterranean Sea and the Black Sea, which has led to genetic differentiation of the Black Sea subspecies.

It has been hypothesized that Black Sea bottlenose dolphins entered the Black Sea during the latest reconnection between the Black Sea and the Mediterranean 7.000-10.000 years ago (Kleinenberg 1956). Migration of bottlenose dolphins between the Mediterranean Sea and the Black Sea might seem to be restricted because of limited individual movement. Because of increasing activities such as boat traffic during the past century within the Turkish straits system (Ozturk and Ozturk 1996, 1997, 2002) it is reasonable to believe that bottlenose dolphin migration between the Black Sea and Mediterranean Sea may have decreased below historical levels.

3. Threat data

Acute conservation problems are known or suspected in the Mediterranean and Black Seas, where past hunting, incidental catches, and environmental degradation have caused population declines (IWC 2004; Reeves and Notarbartolo di Sciara 2006).

In particular the bottlenose dolphin is one of three species of cetaceans living in the Azov-Black Sea basin. Until the 1980's Black Sea cetaceans were mainly threatened by dolphin fisheries. Since then, anthropogenic impacts from pollution, diminishing food resources, live catches, diseases and physical injuries have continued to oppress Black Sea cetaceans (Birkun *et al*. 1992).

3.1 Direct threat

Direct kills: In the past, the Black Sea population was subject to extensive commercial killing. Bottlenose dolphins were taken by all Black Sea countries for manufacturing oils, paint, glue, varnish, foodstuffs, medicine, soap, cosmetics, leather, "fish" meal and bone fertilizer (Kleinenberg 1956; Tomilin 1957; Buckland *et al*. 1992). The total number of animals killed is unknown; however, it is generally acknowledged that all Black Sea cetacean populations, including bottlenose dolphins, were greatly reduced by the dolphin fishery (IWC 1992, 2004). It has been roughly estimated that between the early 1930s and mid 1950s bottlenose dolphins constituted 0.5% of the aggregate numbers of Black Sea cetaceans killed and processed in the USSR (Kleinenberg 1956) including present-day Russia, Ukraine and Georgia. The statistics of the fishery were commonly expressed as total weight or total numbers of animals in the catch without species differentiation. Using the value of 0.5%, Zemsky (1996) estimated that a total of only 4,279 bottlenose dolphins were taken in the USSR (1946-1966) and Bulgaria (1958-1966), with yearly variation from 30 (in 1966) to 656 (in 1959). These figures are very likely underestimated to a great extent for the following reasons: (a) in spring 1946, more than 3,000 bottlenose dolphins were caught during a single day in one location close to the southern Crimea (Kleinenberg 1956); (b) in 1961, the Bulgarian cetacean fishery concentrated almost exclusively on bottlenose dolphins and about 13,000 of them were taken (Nikolov 1963 *fide* Sal'nikov 1967); (c) in April 1966, a single dolphin-processing factory in Novorossiysk, Russia, processed 53 bottlenose dolphins (Danilevsky and Tyutyunnikov 1968).

Thus, taking into consideration the unknown but presumably significant size of the Turkish and Romanian catches, it can be inferred that the number of bottlenose dolphins killed before the mid 1960s was sometimes very high. From 1976 to 1981, bottlenose dolphins were believed to account for 2-3% of the total catch in the Turkish cetacean fishery, which took an estimated 34,000-44,000 small cetacean annually (IWC 1983; Klinowska 1991). This would imply 680-1,320 bottlenose dolphins per year, or 4,080-7,920 for the six years all told. No reliable information is available on illegal commercial killing of Black Sea bottlenose dolphins since the ban on cetacean fisheries in 1983. Isolated cases of deliberate killing and harassment (with pyrotechnic devices and firearms) have been reported in coastal fisheries; for instance at least two bottlenose dolphins were reportedly shot in Balaklava, Ukraine (Reeves and Notarbartolo di Sciara 2006).

Live capture for trade and maintenance in captivity: Since the mid 1960s, many hundreds of Black Sea bottlenose dolphins (more than 1,000 not including those that died during capture operations) have been live-captured in the former USSR, Russia, Ukraine and

Romania for military, commercial and scientific purposes (Entrup and Cartlidge, 1998; Birkun 2002a,b). The capture operations sometimes caused accidental (but usually unreported) deaths. In more recent years (before 2002), 10-20 animals have been taken annually in May–June from a small area in the Kerch Strait, Russia. At present, live capture of bottlenose dolphins is prohibited in all Black Sea countries except for Turkey where permits for the live capture of 30 animals in the Black, Marmara, Aegean and Mediterranean Seas were issued and realized at least in part (23 captures were reported) during 2006 and 2007 (Marine Connection 2007; WDCS 2008; Williamson 2008).

During the 1980s–early 2000s the number of facilities for dolphin shows, "dolphin assisted therapy" and "swim with dolphins" programmes greatly increased in Black Sea countries. The export of bottlenose dolphins from Russia and Ukraine for permanent and seasonal shows also expanded, e.g. to Argentina, Bahrain, Belarus, Chile, Cyprus, Egypt, Hungary, Iran, Israel, Kuwait, Lithuania, Romania, Saudi Arabia, Syria, Turkey, United Arab Emirates, Vietnam, and former Yugoslavia countries. A few captive animals were exported from Georgia to Yugoslavia and then re-exported to Malta where they died within a few years. According to CITES statistics, at least 92 individuals were removed from the Black Sea region during 1990-1999 (Reeves *et al*. 2003) and Russia reportedly has exported at least 66 for travelling shows since 1997 (Fisher and Reeves 2005).

While the purpose of captive breeding has often been used to justify the export of Black Sea bottlenose dolphins for public display, breeding success with the subspecies has been attained in only one oceanarium outside the Black Sea, in Israel (Entrup and Cartlidge, 1998, Birkun, 2002a).

Incidental catch: At present, incidental mortality in fishing gear is probably one of the main threats to *T. t. ponticus*, although these animals have never been the predominant species in national cetacean bycatch statistics. They constituted no more than 3% of the totals in the reports from Black Sea countries during the 1990s (Birkun 2002a,b). At least 200-300 bottlenose dolphins were estimated as being taken incidentally in Turkish fisheries each year (Öztürk 1999). They are known to be susceptible to capture in a variety of fishing nets, including bottom-set gillnets for turbot (*Psetta maeotica*), spiny dogfish (*Squalus acanthias*), sturgeon (*Acipenser* spp.) and sole (*Solea* spp.), purse seines for mullet (*Mugil* spp. and *Lisa* spp.) and anchovy (*Engraulis encrasicolus ponticus*), trammel nets and trap nets. However, only bottom-set gillnets are thought to take significant numbers, especially during the turbot fishing season between April and June every year (BLASDOL, 1999).

3.2 Habitat destruction

The Black Sea is arguably the most degraded sea in the world. The primary conservation problem affecting the surviving *Tursiops truncatus ponticus* is habitat loss and a decline in habitat quality. The ecosystem of the Black Sea is highly changed and disturbed. This is primarily due to extensive pollution, coastal development, disturbance caused by extensive vessel traffic, over-fishing and the impacts of introduced invasive species, including the comb jelly, *Mnemiopsis leidyi* (Zaitsev and Mamaev 1997; Birkun, 2002a,b; Mee *et al*., 2005). The ecosystem is also affected by global change such as climate change and increased UV-radiation.

The Black Sea coastal zone is densely populated, containing a permanent population of approximately 16 million and another 4 million visitors during the summer tourist season

(UNEP, 1999). Almost 1/3 of the land area of continental Europe drains into the Black Sea (BSEP, 1996). The drainage area includes major parts of 17 countries, 13 capital cities and some 160 million people (BSEP, 1996). The second, third and fourth most important European rivers discharge into this sea, but its only connection to the world's oceans is the narrow Turkish straits into the Mediterranean, which are also highly degraded (BSEP, 1996). The enclosed nature of the Black Sea basin, and other aspects of the local geography, means that it is far more heavily influenced by riverside input that most other seas (GESAMP, 1997). It is subject to wide fluctuations in both salinity and temperature. It is also particularly vulnerable to destabilization because the waters are highly stratified, causing the larger part of bottom waters, saturated with H_2S, to be isolated from the ecosystem (GESAMP, 1997). This has limited the diversity of species, including predators.

It has been suggested that the vulnerable nature of the Black Sea and the profound impacts of human actions have caused the sea to undergo an "ecosystem flip" to a new ecological state in which certain marine planktonic predators predominate and fish stocks (including top predators) have become greatly reduced. Reduced stocks have contributed to declines in dolphin populations. Because of its enclosed nature, limited water exchange and slow circulation, the Black Sea is especially vulnerable to pollution. The input of nutrients from agriculture, industry and sewage has caused eutrophication and widespread algal blooms. Sewage pollution also introduces human pathogens, which have been associated with disease in dolphins. Industrial and agricultural chemicals are also present in high concentrations and may be responsible for reported immunosuppression and potentially low reproductive rates in the dolphins.

3.3 Indirect threat

Habitat degradation: In the Black Sea, bottlenose dolphins appear to accumulate higher concentrations of some important synthetic pollutants (DDTs, HCHs and HCB) in their blubber than common dolphins, but lower ones in comparison with harbour porpoises (Birkun *et al*. 1992). Black Sea bottlenose dolphins also accumulate in their tissues (blubber, muscle, liver and kidney were sampled) PCBs, heptachlor, heptachlor epoxide, aldrin, dieldrin, endrin, methoxychlor and mirex (BLASDOL 1999).

The concentrations of total mercury and methylmercury have been determined in tissues of bottlenose dolphins sampled in Crimea (BLASDOL 1999) and along the coast of north Caucasus (Glazov and Zhulidov 2001), while the content of cadmium, chromium, copper, lead, manganese, selenium and zinc was studied in latter individuals only. Mercury levels found in Black Sea bottlenose dolphins were one order of magnitude lower than in their Mediterranean relatives (BLASDOL 1999). It was concluded also that kidney tissue in Caucasian bottlenose dolphins is more contaminated by all mentioned elements in comparison with harbour porpoises from the same area (Glazov and Zhulidov 2001).

Lack of food resources: Coastal fisheries can affect Black Sea bottlenose dolphins indirectly by depleting their prey populations (Reeves and Notarbartolo di Sciara 2006). In particular, declining trends have been observed in the abundance of indigenous mullets (*M. cephalus* and *Lisa* spp.) (Zaitsev and Mamaev 1997). At the same time, the effects of a suspected decrease in cetacean forage resources (Bushuyev 2000) might be offset at least to some extent by the introduced far-east mullet, *M. so-iuy*, which has become abundant in the northern Black Sea since the 1990s (Zaitsev and Mamaev 1997).

Disease: The normal mortality rate is not known for Black Sea bottlenose dolphin populations but some natural pathogens can lead to lethal diseases in these animals (Birkun *et al.* 1992, Birkun, 2002a,b). According to annual compilations of cetacean stranding records in Crimea (Krivokhizhin and Birkun 1999), there was a prominent peak in *T. t. ponticus* strandings in 1990 (20 dead animals, representing 44% of all bottlenose dolphin strandings reported from 1989-1996). The primary cause and magnitude of that spike in bottlenose dolphin mortality remains unclear, although it can be inferred that many more than just 20 animals died. Severe purulent pneumonia was revealed in some cases. The multi-microbial pollution from untreated sewage in coastal waters poses a chronic risk of opportunistic bacterial infections to bottlenose dolphins, and there is evidence that they (as well as other Black Sea cetaceans) are exposed to morbillivirus infection (Birkun 2002a,b). Another ongoing problem (as a potential source of exotic infections and genetic "pollution") is the poorly managed intentional releases and spontaneous escapes of captive bottlenose dolphins and other marine mammals from dolphinaria or oceanaria (e.g. Veit *et al.* 1997; ACCOBAMS 2005).

3.4 Threat connected especially with migrations

There are no known threats different from the ones outlined above.

3.5 National and international utilization

Already covered in section 3.1 above.

4. Protection status and needs

Populations of *Tursiops truncatus* in the North and Baltic Seas, western Mediterranean and Black Sea are currently listed in Appendix II of CMS.

4.1 National protection status

On a national level, Black Sea cetaceans, including bottlenose dolphins, are protected by environmental laws, governmental decrees and national Red Data Books. The bottlenose dolphin is listed in the Red Data Books of Bulgaria, Georgia, Russia and Ukraine (which do not use the IUCN categories and criteria). In Russia and Ukraine, Red Book inscription means that a species should be monitored and managed by appropriate state/national programmes. Such a programme exists in Ukraine since 1999 (the Delfin-programme adopted by the Ministry of Environment). Action Plans for the conservation of Black Sea cetaceans were produced in Ukraine (2001) and Romania (2003) but so far they have no legal effect.

4.2 International protection status

Commercial hunting of Black Sea cetaceans including bottlenose dolphins was banned in 1966 in the former USSR, Bulgaria and Romania; and in 1983 in Turkey. The riparian states assumed international obligations to protect Black Sea cetaceans as contracting parties to the Convention on Biological Diversity (CBD), Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, Appendix II), and the Agreement on the Conservation of

Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS).

The Bern Convention's Recommendation No.86 (2001) and Resolution 1.12, adopted by the 1st Meeting of the Parties of ACCOBAMS (Monaco, 2002), are intended to strengthen prohibition measures for deliberate catch, keeping and trade of Black Sea bottlenose dolphins.

At the 12th Conference of the Parties to CITES (Santiago, 2002), a quota of zero for mercantile export of live bottlenose dolphins wild-captured in the Black Sea has been secured. This measure prohibits transboundary transport of captive Black Sea bottlenose dolphins for "primarily commercial purposes".

In 2003, the IWC Scientific Committee's Sub-Committee on Small Cetaceans reviewed the status of Black Sea bottlenose dolphins and concluded that this population should be managed for conservation as a distinct entity (IWC 2004).

The bottlenose dolphin is included in Annex II of the EC Directive No.92/43/EEC on the conservation of natural habitats of wild fauna and flora. In 1996 the Ministers of Environment of Black Sea countries adopted cetacean conservation and research measures in the framework of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (paragraph 62).

So far, the species *T. truncatus* is listed as Data Deficient (DD) by IUCN, although the Black Sea population is highlighted as a concern in the IUCN 2002-2010 Conservation Action Plan for the World's Cetaceans (Reeves *et al*. 2003). The 3rd Meeting of the ACCOBAMS Scientific Committee (Cairo, 2005) encouraged the initiative proposed by the Cetacean Specialist Group of the IUCN Species Survival Commission (IUCN/SSC/CSG) concerning the development of the IUCN Red List of Mediterranean and Black Sea cetaceans, and the IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 2006) assessed the conservation status of Black Sea population of the bottlenose dolphin as "Endangered" (EN) and confirmed its belonging to the Black Sea subspecies *T. t. ponticus* Barabasch, 1940 (Reeves and Notarbartolo di Sciara 2006). According to the IUCN Red List procedure, it may be expected that the new IUCN status will be established before the end of 2008. As interim measure, the results of the IUCN/ACCOBAMS Red List assessment were adopted by Resolution 3.19 of the 3rd Meeting of Parties to ACCOBAMS (Dubrovnik, Croatia, 2007).

The bottlenose dolphin is included as Data Deficient (DD) in the regional Black Sea Red Data Book (1999). However, in 2002 it was listed as Endangered (EN) in the Provisional List of Species of Black Sea Importance, an annex to the Black Sea Biodiversity and Landscape Conservation Protocol of the Bucharest Convention.

The ACCOBAMS Implementation Priorities for 2002-2006 (Notarbartolo di Sciara 2002) envisaged the development of a pilot conservation and management project in the area between Cape Sarych and Cape Khersones, southern Crimea (Ukraine), for the purpose to establish there a marine protected area specialized in conservation of bottlenose dolphins and harbour porpoises. The 4th Meeting of the ACCOBAMS Scientific Committee (Monaco, 2006) and the 3rd Meeting of Parties to ACCOBAMS (Dubrovnik, 2007) devoted special consideration to the ACCOBAMS Work Programme on Marine Protected Areas. In particular, it was reminded that the 1st Meeting of the Parties (Monaco, 2002) proposed for

the development a pilot protected area within inshore waters in the southern Crimea. In addition to this area it was recommended that the Parties give priority to assessing the value of creating marine protected areas for the conservation of Black Sea cetaceans in territorial waters of Georgia (from Cape Anaklia to Sarp), Russia and Ukraine (Kerch Strait), and Turkey (Bosphorus, Marmara Sea and Dardanelles).

The development of Black Sea regional activities on cetacean research, monitoring and conservation demands to be well-designed and coordinated. With that end in view, the Conservation Plan for Black Sea Cetaceans (Birkun *et al*. 2006) has been approved by Resolution 3.11 of the 3rd Meeting of Parties to ACCOBAMS (Dubrovnik, 2007). Four Black Sea states (Bulgaria, Georgia, Romania and Ukraine), being the contracting parties to ACCOBAMS, are already on the way to put into practice this Conservation Plan. Two other Black Sea countries (the Russian Federation and Turkey) have the opportunity to join to implementation of the plan in 2008 by force of signing the Strategic Action Programme on the Protection and Rehabilitation of the Black Sea. This new instrument of Black Sea regional importance, drafted by the Black Sea Commission, envisages the *ad hoc* management target on the adoption and implementation of the Conservation Plan for Black Sea Cetaceans by all six Black Sea countries.

4.3 Additional protection needs

It is recommend the inclusion of the subspecies *Tursiops truncatus ponticus*, population of Black Sea, in Appendix I of CMS.

5. Ranges states[1]

Listing of states where the occurrence of Black Sea bottlenose dolphins has been proved: BULGARIA, GEORGIA, ROMANIA, Russian Federation, Turkey and UKRAINE.

6. Comments from Range States

7. Additional remarks

8. References

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

A. PROPOSAL: Include Irrawaddy dolphin *Orcaella brevirostris* (Owen in Gray, 1866) on CMS Appendix I

B. PROPONENT: Government of the Philippines

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**:	Mammalia
1.2	**Ordo**:	Cetacea
1.3	**Familia**:	Delphinidae
1.4	**Species**:	*Orcaella brevirostris* (Owen in Gray, 1866)
1.5	**Common name(s)**:	English: Irrawaddy dolphin French: Orcelle Spanish: Delfín del Irrawaddy German: Irrawadi Delphin Myanmar: Labai Indonesia: Pesut Malaysia: Lumbalumba Cambodia: Ph'sout Lao: Pha'ka Philippines: Lampasut

2. Biological data

2.1 Distribution

Dolphins of the genus *Orcaella* were recently split into two species, the Irrawaddy dolphin *Orcaella brevirostris*, occurring in five freshwater systems and estuarine waters of Southeast Asia including a geographically isolated population in Malampaya Sound, Palawan, Philippines, and extending west across the Bay of Bengal and south along the east coast of India to Vishakhapatnam, and the snub-fin dolphin *O. heinsohni*, occurring in the coastal waters of northern Australia and southern Papua New Guinea (Beasley *et al.,* 2005). The following account only addresses *O. brevirostris*.

Freshwater populations of Irrawaddy dolphins occur in three river systems - the Ayeyarwady (formerly Irrawaddy) of Myanmar (formerly Burma), Mahakam of Indonesia, and Mekong of Cambodia, Lao PDR and Vietnam - and two partially isolated brackish or freshwater lakes - Chilika of India and Songkhla of Thailand. All five freshwater/brackish populations of Irrawaddy dolphins are believed to be demographically isolated from members of the species occurring in marine waters. The downstream range extents of the riverine populations are about 180, 500 and 1000 km from the sea in the Mahakam, Mekong and Ayeyarwady rivers,

respectively, and only a few strandings and no sightings of Irrawaddy dolphins have been documented along adjacent coastlines within 80 km of both Chilika and Songkhla lakes (Smith *et al.,* in press-a).

Based on a visual boat-based survey conducted in December 2002 of the entire length of the Ayeyarwady River (1,788 km of continuous trackline in the main channel and 202 km in side channels), the current dry-season distribution of the Irrawaddy dolphin population is believed to be limited to a 398-km river segment located between Mingun (about 8 km upstream of Mandalay and 970 km from the sea) and Bhamo (about 88 km downstream of the river's origin at the confluence of the Maykha and Maylikha tributaries). The results of this survey indicated a range decline of 488 km in river length (or 56.7%) compared with the historical distribution reported by Anderson (1879).

During 14 extensive surveys of the entire potential range of dolphin distribution in the Mahakam River, from the delta to rapids located ca. 600 km upstream of the mouth and including all tributaries in between, 98 sightings of Irrawaddy dolphins were confined to a 300 km segment of the main river between Muara Kaman (ca. 180 km from the coast) and Datah Bilang, Belayan, Kedang Rantau, Kedang Kepala, Kedang Pahu and Ratah tributaries, and Melintang and Semayang lakes (Kreb and Budiondo, 2005; Kreb *et al.*, 2005).

Based on 249 days (1044 hours) of boat-based surveys conducted along 13,200 km of linear river length during 2001 – 2005, the current range of Irrawaddy dolphins in the Mekong is believed to be generally limited to a 190-km segment between Kratie (about 500 km upstream of the river mouth in Vietnam) to slightly upstream of the Lao PDR/Cambodia border at Khone Falls, which physically obstructs farther upstream movement (Beasley *et al.*, in press). Based on interview surveys conducted by Baird and Mounsouphom (1994) dolphins are believed to have been once fairly common in the Sekong River and its tributaries as far upstream as the Kalaum District (approximately 950 km upstream of the river mouth in Vietnam). Recent interview surveys indicate dolphins now rarely ascend the Sekong River and its tributaries. No dolphins have been reported in Tonle Sap Great Lake since 1997 (Baird and Beasley 2005). In the Mekong mainstem, Irrawaddy dolphins are now rarely found south of Kratie except occasionally during the wet season (June to October) when some animals probably follow fish migrations downstream. During a survey of almost the entire length (224 km) of the two main distributaries of the Mekong River (Tien and Hau Giang) in April 1996, Smith *et al.* (1997a) were unable to find a single dolphin. A more recent survey of the Mekong River in Vietnam was conducted in May 2005 (Beasley *et al.*, 2005b). A total of 486 km were searched during 42 hours. No dolphins were sighted. Although no dolphins have been recorded alive in the Mekong River of Vietnam during recent years, one dolphin was accidentally caught in a set bag net in April or May 2002 in Vam Nao of the Phu Tan District, An Giang Province (Chung and Ho, 2000), and another dolphin in October 2005 in Vinh Xuong Commune of the Tan Chau District, An Giang Province (adjacent to the Cambodia border) (Beasley *et al.,* 2005b).

In northern and eastern Borneo of Malaysia and Brunei, Irrawaddy dolphins have been recorded in coastal waters near Muara Island, in Sandakan and Kuching Bays, and in the mouths or lower reaches of the Brunei, Sarawak, Rajang, Kinabatangan, Baram, and Batang Rivers (Weber, 1923; Banks, 1931; Gibson-Hill, 1950; Mörzer Bruyns, 1966; Pilleri and Gihr, 1972, 1974; Dolar *et al.*, 1997; Beasley and Jefferson, 1997; Beasley, 1998).

The only records from southern Borneo in Indonesia, outside of the Mahakam River (see above), are second-hand reports from the Kumay and Kendawangan river mouths (Perrin *et*

al., 1996; Rudolph *et al.,* 1997). The species has been recorded in the Belawan Deli River of northeastern Sumatra, Rajang River, Sarawak, Belitung Island and Cilacap of southern Java, Surabaya of northeastern Java, Ujung Pandang or Makassar of Sulawesi, and Biak Island and in various river mouths of the southwestern coast of Irian Jaya (Mörzer Bruyns, 1966).

During three surveys of the entire Malampaya Sound, Philippines (total area 231 km^2), one each in the pre-monsoon, monsoon and post-monsoon seasons, Irrawaddy dolphins were observed only in the inner portion (total area 134 km^2) (Smith *et al.*, 2005). The Irrawaddy dolphin population in Malampaya is the only one known of the species in the Philippines and the nearest area where another population of Irrawaddy dolphins is known to occur is northern Borneo, some 550km to the south (Smith *et al.*, 2005).

Irrawaddy dolphins occur in marine waters of Cambodia along the coast of the Koh Kong Province, Kompong Som Bay and Raem National Park (Perrin *et al.*, 2005). The species occurs in nearshore waters of Thailand, in the the Gulf of Thailand at the mouths of the Chao Phraya, Mae Nam Chin, Chanthaburi and Pattani Rivers, and was reported by fishermen to also occur in Phang Nga Bay and in certain areas of the the Andaman Sea (Chantrapornsyl *et al.*, 1996). In Myanmar, the only records of Irrawaddy dolphins in the Bay of Bengal are from the semi-enclosed bay offshore the Kyaukpyu and Tennasarim river mouths in the Mergui Archipelago in the far south of the country (Smith, 2006), in the Ayeyarwady Delta (Smith *et al.*, in press-b) and in the lower reaches and estuaries of the Myebone, Kalidan, and Kyaukpyu Rivers along the Rakhine (Arakan) coast in the far north of the country (Smith *et al.*, 1997b). In Bangladesh, Irrawaddy dolphins occur in waterways of the Sundarbans Forest (Mörzer Bruyns, 1971; Kasuya and Haque, 1972) - mainly in the western and downstream portions during the dry season, which are characterized by higher salinity and lower turbidity compared with the upstream and eastern portions (Smith *et al.*, 2006) and along the coast near Cox's Bazaar (Haque, 1982) - offshore of mangrove forests near Chittagong (Smith *et al.*, 2001), and offshore of the Sundarbans and Meghna River mouth.

The species is found in Chilika Lake or Lagoon in Orissa, India (Annandale, 1915; Dhandapani, 1992). The outer channel supports about 65% of the entire dolphin population while the central and southern sectors support the remaining individuals (Pattnaik *et al.,* in press). Although there are published records of the species between Vikshakhapatnam to Calcutta (Owen, 1869; Cobbold, 1876; Ellerman and Morrison-Scott, 1951; James *et al.*, 1989), there is no recent information about its current range along the coast of northeastern India.

2.2 Population

Statistically rigorous abundance estimates are available for only a few portions of the species' range: 77 (CV 27.4%) in Malampaya Sound, Philippines (Smith *et al.*, 2004a); at least 125 (95% CI = 114-152) in the Mekong River (Beasley *et al.*, in press); 70 (*CV* = 10%; 95% CL = 58-79) in the Mahakam River, Indonesia (Kreb *et al.*, in press); 58-72 in the Ayeyarwady River, Myanmar (Smith *et al.*, in press-b); 62-98 in Chilika Lake, India (Pattnaik *et al.*, in press)**;** 5,383 (CV=40%) in freshwater affected coastal waters of Bangladesh (Smith *et al.*, 2005); and 451 (CV=9.6%) in waterways of the Sundarbans mangrove forest of Bangladesh (Smith *et al.,* 2006).

Probable declines in the number of individuals can be inferred for several populations. For small cetaceans generally, it is recommended that yearly removals (due to entanglement, boat collisions, live-captures, etc.) should not exceed 1-2% of the population size (Wade, 1998) –

the lower bound being more applicable to very small populations that are already vulnerable to extirpation due to demographic, genetic, and other factors.

The Irrawaddy dolphins of Malampaya Sound was first estimated in 2001 (Smith et al, WWF-Philippines, 2002) at 60.4 individuals (CV = 25.7%). Aquino et al (WWF 2006) estimated the population at 20.06 (CV = 77.6%) individuals. The survey also documented the presence of calf indicating continuous reproductive activity. Matillano (WWF, 2007) tallied dolphin mortality from 2001 to 2007 at thirty four (34) individuals.

For the Mekong River, using an estimate of four deaths per year as the annual incidental catch rate (calculated from the mean number of carcasses recovered and determined to have died from gillnet entanglement by Beasley *et al.* (2002) and Beasley (unpublished) during 2001-2003), the kill represents 5.8% of the population, according to the best estimate of abundance (69) made during surveys conducted in the same years.

The Mahakam population has been subject to a mean annual mortality rate of greater than 10% in recent years, with the majority of deaths attributed to gillnet entanglement (Kreb *et al.*, in press).

In Songkhla Lake circumstantial evidence from sighting rates indicates declining numbers, a conclusion reinforced by the high mortality experienced by the population (as evidenced by the large number of recorded deaths – 43 between January 1990 and December 2003; Beasley *et al.*, 2002; Smith *et al.*, 2004) in relation to its extremely low (although precisely unknown) population size.

Considering that the small sizes of these populations already make them vulnerable to extirpation from demographic variability, inbreeding depression and catastrophic environmental and epizootic events, the current rate of removals will almost certainly lead to extirpation within a short time (decades, at most).

2.3 Habitat

Irrawaddy dolphins are adapted to relatively rare ecological conditions – deep pools of large rivers and nearshore marine environments (including appended lakes) with freshwater inputs (see reviews in Stacey and Leatherwood, 1997; Stacey and Arnold, 1999; Smith and Jefferson, 2002). The geographically isolated Philippine population is patchily distributed within the inner portion of Malampaya Sound. Their existence in the area is heavily entwined with that of the communities surrounding the Sound particularly with fishery activities (Aquino et.al.,WWF, 2006).These habitats are subject to intensive and increasing development and use, which could result in population displacement and extirpation.

2.4 Migrations

No information is available on the long-range movements of Irrawaddy dolphins, but sighting data from waterways of the Sundarbans mangrove forest in Bangladesh show clear seasonal movements in response to changes in freshwater inputs, with the species moving seasonally along a south-west/north-east axis following the salinity gradient. Irrawaddy dolphins occur in the adjacent section of the Sundarbans forest in India but their condition is unknown. Movement across national borders is known to occur in the Lao PDR/Cambodia transborder pool of the Mekong River.

3 Threat data

3.1 Direct threat to the population

Irrawaddy dolphins have been documented accidentally caught in fishing nets in almost all areas where they have been studied, including all five of the freshwater populations (Smith *et al.*, in press-a). The most detailed information on bycatch comes from the Mekong River where, of the 15 deaths confirmed to be have been caused by humans in 2001-2005, 13 or 87% were due to gillnet entanglement (Beasley *et al.*, in press). Based on reports from local fishermen and the retrieval of eight carcasses between 1995 and 2005, Kreb *et al.* (in press) documented 48 deaths of which 66% occurred as a result of gillnet entanglement in large mesh (10 –17.5 cm) gillnets. Mortalities have also been recorded in drifting gill nets targeting elasmobranchs in coastal waters of Bangladesh (Smith *et al.*, 2005) and bottom-set nylon gillnets used for catching crabs in Malampaya Sound (Smith *et al.*, 2004).

Beasley *et al.* (2002) listed 28 records of dolphins that stranded in Songkla Lake between January 1990 and April 2001. At least 13 of these were judged to have died from net entanglement, based upon the presence of net scars on the carcass or the reports of local fishermen. Of the total strandings, at least nine were neonates (i.e., one meter in length or smaller). Since that report, 15 additional strandings have been recorded, including nine calves (four of these in February 2003 and two in December 2003) and a pregnant female (Smith *et al.*, 2004). Several of those 15 animals were believed to have been killed accidentally in gill nets and fish traps set for sea bass, the carcasses having been discarded and then drifting ashore.

Smith *et al.* (in press-b) recorded a total of 5,701 fishing gears in the main channel of the Ayeyarwady River during November-December 2002. Gill nets accounted for the majority of fishing gears (53.5%). Gill nets were also the most widespread gears in terms of their distribution throughout the river, and there was a significant positive relationship between gill net encounter rates (i.e., number of gears observed each day) and downstream progress on the survey. The fact that gillnets were present in higher frequencies in areas where dolphins were reported to occur historically but were not observed during the 2002 survey implies that these fishing gears may be at least partially responsible for the range decline of the species.

During interviews conducted during 2005, fisheries officials, fish contractors and local fishermen from the Ayeyarwady reported that electric fishing represents the greatest threat to the dolphins due to the risk of electrocution. Several fishermen stated that fish catches had declined substantially since electric fishing became widespread several years ago and that dolphins now avoided certain areas because they were afraid of being shocked (Smith *et al.,* in press-b). Electric fishing is popular in the Ayeyarwady because the equipment is relatively inexpensive (and the battery can be used in the home for other purposes), needs little maintenance (unlike nets, longlines, bamboo traps and fishing fences which require constant repair), and results in relatively large catches with little effort (Smith *et al.*, in press-b). Electric fishing has been cited as being responsible for the largest number of recent known deaths of the baiji *Lipotes vexillifer*, a "critically endangered" dolphin in the Yangtze River of China, and has come to be regarded as the main anthropogenic threat to the survival of that species (Zhang *et al.*, 2003).

Identified threats to the Irrawady dolphin's survival in the Philippines include fishery by catch, habitat degradation, and possibly prey depletion (Dolar, 1999). Majority of the cause of

death is fishery by-catch. This was confirmed by a study on the CPUE of fishing gears implicated with dolphin mortalities (Gonzales and Matillano, WWF, 2007) states: The distribution of fishing gears shows that almost all of the areas of the Inner Sound are occupied by the seven gears related to Irrawaddy Dolphin conservation and describes how narrow is the swimming path left for the dolphins to move around freely in the Inner Sound. There is only a slim chance that the dolphin could not encounter a net, while navigating in the water column. With current fisheries and Irrawaddy Dolphin interaction and other circumstances: 1) increasing number of Irrawaddy Dolphin mortality, 2) increase in kinds of gears associated with the mortality, 3) increasing efforts of Irrawaddy mortality-associated fishing gears, and 4) co-occurrence of Irrawaddy mortality-associated fishing gears and identified Irrawaddy Dolphin sighting areas , the future of the Irrawaddy Dolphin population seemed uncertain, while hope lingers because fishermen still observe young Irrawaddy Dolphins wandering around the Inner Sound.

3.2 Habitat destruction

Many dams have been proposed that may adversely affect the channels inhabited by Irrawaddy dolphins in the Mekong River Basin. Of greatest concern are the large run-of-the-river dams (dams without a reservoir that generally preserve a relatively natural flow regime) proposed for the Mekong mainstem near Stung Treng and Sambor (Perrin *et al.,* 1996; also see Mekong Secretariat, 1995). In the Sekong River system, at least two dams have been proposed tens of kilometers below the reported upstream limit of the Irrawaddy dolphin. Dolphins are also threatened in the Sekong system by the proposed Xakaman and Xepian/Xenamnoi dam projects. This last project would divert almost all of the flow from the Xepian River to a reservoir behind another dam on the Xenamnoi River (Baird and Mounsouphom, 1997). According to Öjendal *et al.* (2002) dams that will probably be constructed in the Se San/Sre Pok watershed, which comprises a network of tributaries that converge (together with the Sekong River) with the Mekong and provide about 10% of the total flow at Stung Treng, Cambodia, include the Se San 3 (located in Vietnam about 50 km from the Cambodian border and 20 km downstream of Yali Falls (with a generating capacity of 260 MW at an estimated cost of US$ 320 million),,Se San 4 (located in Vietnam about eight km from the Cambodian border (with a generating capacity of 300 MW at an estimated cost of US $338 million) and the Upper Kontum (located in Vietnam in the Dak Nghe tributary of the Sesan River upstream of Yali Falls). In addition to dams in the Se San/Sre Pok of Vietnam, a number of projects have been proposed in this river basin downstream in Cambodia, including the Lower Se San 2 and Lower Sre Pok 2, but these are unlikely to be built in the near future (Öjendal *et al.,* 2002). The only dam currently in place in the Se San/Sre Pok watershed is at Yali Falls, Vietnam. This dam was completed in 2001 and is 65 meters high with a 64.5 km^2 reservoir. It generates 720 MW of electricity and is believed to have cost about one billion US dollars (Öjendal *et al.,* 2002). Serious declines in fisheries followed closure of the dam due to reduced and erratic flows during the dry season and changes in the overall morphology of the river downstream. Proposed navigation improvement schemes in the Mekong River, which entail blasting the pool-riffle sequences that compose dolphin habitat, would also probably lead to a dramatic decline, if not extinction, of the Irrawaddy dolphin population due to the elimination or severe degradation of their deep pool habitat (Smith *et al.*, in press-a).

At the northern tip of Songkhla Lake a small connecting channel to the Gulf of Thailand previously existed but was blocked by a dam constructed in 1955 to support irrigation of surrounding agricultural fields. The reduced salinity in the northern portion of the lake, which

is the only area available for dolphins to inhabit due to habitat loss in the middle and southern portions (see below), has dramatically affected the species composition and overall catches of fisheries in the lake with unknown effects on the dolphins and their prey. Blockage of the northern channel has also probably reduced freshwater flushing in the lake and therefore exacerbated already existing problems of sedimentation and high pollutant loads from expanding agriculture and aquaculture activities (Smith *et al.,* in press-a).

In waterways of the Sundarbans mangrove forest the dependence of the Irrawaddy dolphins on relatively deep waters and large-small channel confluences suggests that the animals may be particularly susceptible to potential habitat loss from sedimentation caused by declining freshwater supplies (Smith, 2005). Water is abstracted from the Ganges-Brahmaputra-Meghna basin (which is the primary source of freshwater flow for the Sundarbans) by an extensive network of at least 20 high dams and 21 low-gated dams (barrages) and lost to evaporation from reservoirs and open canals and seepage to recharge groundwater supplies that are generally declining due to intensive extraction by tube wells (Smith and Reeves, 2000, Smith *et al.*, 2000). The problem of declining freshwater supplies to the Sundarbans Delta will become a much greater threat to dolphins if India proceeds with a collection of large-scale, inter-basin water transfer projects which will involve additional dam construction and diversion of water from rivers within the Ganges-Brahmaputra-Meghna system (Smith *et al.*, in press-a).

Deforestation and mining of gold, sand and gravel introduce and redistribute large quantities of sediments, causing major changes to the geomorphologic and hydraulic features of rivers and marine appended lakes that allow them to support dolphin populations. A total of 890 gold mining operations were recorded in the Ayeyarwady River during a dolphin survey in 2002, including 180 operations within the extent of dolphin occurrence. These operations, including large boat dredges (15.8%) and hydraulic land blasters (13.4%), were generally located in areas of reduced current, above and below defiles and near channel convergences – the same areas that constituted the preferred habitat of Irrawaddy dolphins (Smith *et al.*, in press-b). Although no large-scale gold mining operations occur in the Mekong mainstem, gold mining dredges operate in the Sekong River where dolphins have been reported occasionally to occur. Operations also exist on smaller tributaries, such as the Kampi River which flows into the Mekong close to an area of core dolphin distribution (Beasley *et al.*, in press).

Increased sedimentation resulting from deforestation in surrounding watersheds has resulted in declining water depths in Songkhla, Chilika and Semayang Lakes. The latter water body is appended to the Mahakam River and previously supported dolphins throughout most of its breadth. Now it contains suitable habitat only in a small area near the channel connecting it with the mainstem (Kreb *et al.*, in press). Between 1992 and 1997 the maximum depth of Chilika Lake declined from 3.4 to 1.4 meters and the accumulation of sediments led to shrinkage of the opening channel and a dramatic decline in salinity. A new channel dredged in the northern portion of the lake in 2000 has apparently mitigated at least some of the problems caused by sedimentation (Pattnaik *et al.*, in press).

A source of habitat loss and population fragmentation in several areas has been the proliferation of fixed fishing gears. In the middle and southern portions of Songkhla Lake about 27,000 *Sai nong* or sitting traps (two wings composed of small mesh nets suspended between bamboo poles, each about 100m long, deployed in a V-formation, with a large trap at the apex) and 13,000 *Sang sai* or barrier traps (closely spaced bamboo poles, sometimes with

a net suspended in between, starting from the shore and extending 200-300 m out with traps placed periodically along its length) create more than 8000 km of linear barrier in multiple rows. These fishing structures are left in place year-round and restrict dolphin movements such that their habitat is substantially reduced and the potential for demographic interaction with individuals in the Gulf of Thailand is eliminated (Smith *et al.*, 2004). Fixed fishing gears also occupy most parts of Semayang Lake and limit dolphin movements to a narrow, dredged channel that is subject to intensive vessel traffic (Kreb *et al.*, in press).

During a survey in the Mekong Delta, Smith *et al.* (1997a) observed several dozen stow nets, each one stretching 200-400 m, and over 10 rows of gillnets laid out so that they stretched across nearly the entire channel with only small openings to permit vessel traffic. These authors speculated that the effective blockage of the delta by these nets may at least partially explain the lack of dolphin sightings during a comprehensive survey in the Mekong River of Vietnam conducted in 1996.

3.3 Indirect threat

During a survey in December 2004 of the Ayeyarwady River between Mandalay and Bhamo, 61 samples of fish muscle tissue were collected (51 of *Ompok* sp. and 10 of *Crossocheilus burmanicus*). The mean mercury concentration for the *Ompok* specimens was 182 ng/g (SD = 96, range = 82-684), and for the *C. burmanicus* samples was 30 ng/g (SD = 18, range = 15-75). Although these levels are not dramatically elevated, the measured concentrations were high enough to give reason for concern about their potential effects on piscivorous wildlife and humans. Three of the *Ompok* samples (5.8%) were above the 300 ng/g limit established for human consumption by the United States Environmental Protection Agency and one sample was above the 500 ng/g standard set by the World Health Organization. It is important to note that these criteria are human-based and assume that fish are only a small portion of an individual's diet. The United States Fish and Wildlife Service is currently defining a mercury concentration effect level for the prey of piscivorous wildlife, and it will probably be set at around 100 ng/g (Darell Slotton, personal communication). Forty nine of the *Ompok* samples (or 96% of the total) were above this level. This is significantly higher than the levels recorded for *Ompok* fish during an investigation in 2002 investigation when only one out of 26 (or 4% of the total) samples of *Ompok* tested for mercury was above 100 ng/g (Smith *et al.,* in press-b).

3.4 Threat connected especially with migrations

The lack of information on movement patterns of Irrawaddy dolphins makes it difficult to directly connect realized and potential threats to migrations but plans for dams and proposed navigation improvement schemes (see above) would undoubtedly interfere with upstream and downstream movements of the species in the Mekong River. In Songkhla Lake and the mouth of the Mekong River, the extremely high density of fixed fishing gears also eliminates any possibility of movements in or out of these water bodies.

3.5 National and international utilization

Removal from the wild for live display is an additional threat to the species. These removals have the same effects as accidental or deliberate killings on the viability of wild populations. The charismatic appearance of Irrawaddy dolphins and behavioral characteristics they exhibit in the wild (e.g. spitting water, spyhopping, fluke-slapping, etc.) make them especially

attractive for shows and display in dolphinariums. The commercial motivation for capturing Irrawaddy dolphins is also high due to the ability of the species to live in freshwater tanks, which avoids the high cost of water quality systems necessary for maintaining a saline environment.

Sixteen Irrawaddy dolphins were captured from Semayang Lake (Tas'an and Leatherwood, 1984; an appended water body to the Mahakam River; 6 in 1974 and 10 in 1978). Six more Irrawaddy dolphins were removed from the Mahakam River and exported to the same aquarium in 1984 (Wirawan, 1989). The first known live-capture of Irrawaddy dolphins in Cambodian waters occurred in 1994 (Perrin *et. al.*, 1996). In January 2002, at least eight Irrawaddy dolphins were captured by local Cambodians. No credible population assessments were conducted prior to any of the captures discussed above.

Another form of use is dolphin watching in the wild. Irrawaddy dolphins are the subject of nature tourism programs in the Mekong River and Chilka Lake. Although this form of tourism has in some cases been promoted as a substitute for captive displays, in the latter two situations, there is concern among scientists that collisions with dolphin watching vessels and the habitat disturbance caused by this activity may threaten the viability of these populations.

4 Protection status and needs

4.1 National protection status

Directed taking of cetaceans is prohibited in Bangladesh, India, Laos, Malaysia, and Thailand. The legal status of Irrawaddy dolphins in Indonesia, Myanmar and Timor Leste is unclear. In Cambodia a new fisheries law and royal decree will provide protection to all cetaceans. In Vietnam all cetaceans are protected by a decree of the national assembly but this is not generally enforced. Some cetaceans are given legal protection in the Philippines but as of 2002 Irrawaddy dolphins are not included in the list of species (Perrin *et al.*, 2005).

Although a few areas where the species occurs have been designated as protected, little has been done to conserve dolphin habitat. Malampaya Sound was proclaimed a protected seascape in 2000, but this is the lowest possible prioritization given to a protected area. Portions of Irrawaddy dolphin habitat in the Sundarbans Delta of Bangladesh and India are included within Protected Forests and World Heritage Sites, but no specific provisions have been implemented for conserving dolphins or their habitat. The Cambodian Department of Fisheries has drafted a Royal Decree for protection of Irrawaddy dolphins in the Mekong River, which includes the designation of eight protected areas (5721 hectares) in a 190 km segment of the river above Kratie. In December 2005, the Department of Fisheries, Myanmar, announced the establishment of a protected area for Irrawaddy dolphins in a 74-km segment of the Ayeyarwady River between Mingun and Kyaukmyaung. Protective measures in the area include requiring fishermen to immediately release dolphins if found alive and entangled in their nets and prohibiting the catching or killing of dolphins and trade in whole or parts of them and the use of electricity fishing and gill nets that obstruct the water-course, are more than 300 feet long, or spaced less than 600 feet apart (Smith *et al.*, in press-b).

4.2 International protection status

Irrawaddy dolphins are listed by the IUCN as "data deficient" although the IUCN is currently reassessing the status of the species. Five geographically isolated populations: Ayeyarwady, Chilika, Mahakam, Mekong, Songkhla and Malampaya (see above) have been Red-Listed as "critically endangered." The species was included in CITES Appendix I in response to concern about the potential for international trade in live specimens to adversely affect wild populations.

4.3 Additional protection needs

The Action Plan for the Conservation of Freshwater Populations of Irrawaddy Dolphins (Smith *et al.*, in press-c) noted that multiple-use protected areas will play a key role for conserving freshwater populations of Irrawaddy dolphins. Protected areas could be a particularly effective conservation tool due to the fidelity of the species in freshwater systems to relatively circumscribed areas, which aids effective management. Priority areas for protected area status include: (1) in the Mekong River, nine deep pool areas between Kratie and the Lao PDR-Cambodia border totaling 5,632 ha; (2) 10-20 km segments in the Mahakam River, at the Kedang Pahu tributary mouth at Muara Pahu Town, the mouths of the Kedang Kepala and Kedang Rantau, and the Pela tributary including the southern portion of Semayang Lake; (3) in the Ayeyarwady River, segments between the Taping river confluence at Bhamo to the upstream end of the second river defile at Sinkan (36 linear km), the downstream end of the second river defile to Tagaung (165 linear km), and the downstream end of the third river defile at Kyaukmyaung to Mingun (74 linear km); (4) in Songkhla Lake, the middle portion of upper Thale Luang and (5) in Chilika Lake, the area between Magamukh and the outer mouth.

The Action Plan for the Conservation of Freshwater Populations of Irrawaddy Dolphins also provided details on strategies for mitigating bycatch that included (1) establishing core conservation areas where gillnetting would be banned or severely restricted; (2) promoting net attendance rules and providing training on the safe release of entangled dolphins; (3) initiating a program to compensate fishermen for damage caused to their nets by entangled dolphins that are safely released; (4) providing alternative or diversified employment options for gillnet fishermen; (5) encouraging the use of more benign fishing gears by altering or establishing fee structures for fishing permits to make gillnetting more expensive while decreasing the fees for non-destructive gears; and (6) experimenting with acoustical deterrents and reflective nets.

5. Range States[1]

BANGLADESH, Brunei Darussalam, Cambodia, INDIA, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, PHILIPPINES, Singapore, Thailand, Timor-Leste, Viet Nam.

6. Comments from Range States

[1] CMS Parties in capitals.

7. Additional remarks

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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: Senegal

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Delphinidae
1.4	**Genus or species**	*Sousa teuszii* (Kükenthal 1892)
1.5	**Common name(s)**	English: Atlantic Humpback Dolphin French: Dauphin à bosse Atlantique Spanish: Delfín jorobado Germany: Kamerun-Flußdelphin del Atlantico Portuguese: Golfinho-corcundo-do-Atlântico

2. Biological data

2.1 Distribution

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

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

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

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

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

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

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 the Atlantic humpback dolphin[1]

Confirmed range states: ANGOLA, CAMEROON, Gabon, GAMBIA, GUINEA, GUINEA-BISSAU, MAURITANIA and SENEGAL.

Possible range states: GHANA and TOGO

6. Comments from Range States

The proposal is supported by Guinea and Mauritania

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

A. PROPOSAL: Include the Cheetah *Acinonyx jubatus* on CMS Appendix I

B. PROPONENT: Government of Algeria

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Carnivora
1.4	**Familia**	Felidae
1.5	**Species**	*Acinonyx jubatus* (Schreber, 1775)
	Common name(s)	English: Cheetah
		French: Guépard
		Spanish: Chita

1.6 Taxonomy and evolution

Cheetah ancestors seem to have originated in North America about 4 million years ago during the Pliocene period (5.2 to 1.6 million years ago). This cheetah relative, Miracinonyx, appears to be a common ancestor of both the cheetah and the puma (cougar). During the Ice Age, Miracinonyx migrated across continents. Its descendants developed the characteristics that make the cheetah the unique animal that it is today.

Cheetahs hunted prey in the open plains as grasslands replaced forests during this time period. The sleek characteristics of the modern cheetahs became more prominent. This was especially evident in reduced body size and elongated limbs. The modern cheetah evolved into its present form about 200,000 years ago. Cheetah relatives had worldwide distribution until about 20,000 years ago. They were common throughout Africa, Asia, Europe and North America.

Genetic research has shown that today's cheetah populations are descendants of but a few animals that remained after the Pleistocene era about 10,000 years ago, at which point the population experienced a founder event generally referred to as a population bottleneck (Menotti-Raymond and O'Brien 1993, O'Brien et al. 1985, O'Brien et al. 1983). The cheetah somehow survived this time of mass extinction and the population gradually increased.

Cheetah Subspecies

Five subspecies are considered valid by most taxonomists. But the validity of the existence of sub-species is now questionned. Genetic research has shown the genetic distance between two subspecies *A. j. jubatus* and *A. j. raineyi*, is trivial, 10 to 100 times less, for example, than the genetic distance between human racial groups (Marker, 1998).

The recognized subspecies are as follows:

- *Acinonyx jubatus venaticus* (Griffith, 1821): **North Africa and Asia**
  Africa: Algeria, Djibouti, Egypt, Libya, Mali (northern), Mauritania (northern), Morocco, Niger (northern), Tunisia, Western Sahara.
  Asia: Afghanistan, India, Iran, Iraq, Israel, Jordan, Oman, Pakistan, Saudi Arabia, Syria, Russia and the Commonwealth of Independent States.
- *Acinonyx jubatus hecki* (Hilzheimer, 1913): **West Africa**
  Benin (northern), Bukina Faso, Ghana, Mali (southern), Mauritania (southern), Niger, and Senegal.
- *Acinonyx jubatus soemmeringii* (Fitzinger, 1855): **Central Africa**
  Cameroon (northern), Chad, Central African Republic (northern), Ethiopia, Nigeria (northern), Niger (southern), and Sudan.
- *Acinonyx jubatus raineyii*: (Heller, 1913): **East Africa**
  Kenya, Somalia, Tanzania (northern), and Uganda.
- *Acinonyx jubatus jubatus:* (Schreber, 1976): **Southern Africa**
  Angola, Botswana, Democratic Republic of Congo (southern), Mozambique, Malawi, South Africa, Tanzania (southern), Zambia, Zimbabwe.

Once thought to be a separate subspecies, *Acinonyx jubatus rex*, the king cheetah, is in fact no different than any other cheetah: its coat pattern is just a rare colour variation with stripes versus spots.

2. Biological data

Due to the cheetah's specialization for speed, it has developed many morphological and physiological adaptations. For aerodynamics, it has a small head, lightweight and thinly boned skull, flat face, and a reduced length of muzzle that allows the large eyes to be positioned for maximum binocular vision, enlarged nostrils, and extensive air-filled sinuses (Ewer 1973). Its body is narrow and lightweight with long, slender feet and legs and specialized muscles, which act, simultaneously, for high acceleration and allow for greater swing to the limbs (Hildebrand 1959, Hildebrand 1961, Neff 1983). The cheetah is the only cat with short, blunt claws, which lack skin sheaths, making the claws semi-retractable, thus providing added traction like a sprinter's cleats (Ewer 1973). The distinguishing marks of a cheetah are the long tear-drop shaped lines on each side of the nose from the corner of its eyes to its mouth.

Even though it is customized for speed, the cheetah can run only 300 to 400 meters before it is exhausted; at this time the animal is extremely vulnerable to other predators, which may not only steal its prey but attack it as well (Caro 1994).

Cheetahs are primarily diurnal, possibly due to the nocturnal behavior of competing predators (Nowell and Jackson 1996). It has been suggested that the cheetah has larger litter sizes as a strategy to offset high juvenile mortality caused by lions and hyenas (Burney 1980, Caro 1994, Hamilton 1986, Laurenson et al. 1995). Cheetahs have been observed scavenging and returning to a kill, but this is not common behavior (Burney 1980, Caro 1982, Graham 1966, Pienaar 1969, Stander 1990). Cheetahs also are known to remain on kills in areas where lions and hyenas are not present (Nowell and Jackson 1996, Wacher et al, 2005).

Cheetahs are considered more social than most other felids, with the exception of the lion (Caro 1994). Large groups of cheetahs (up to 19 individuals of different age groups) have been observed and reported in Namibia and east Africa (Graham 1966, Marker-Kraus et al. 1996, McVittie 1979). Male and female siblings tend to stay together for several months after independence from their dam (Caro 1994), and male littermates remain together in coalitions (Caro 1994). Males in coalitions have been reported to better hold and defend territories (Caro 1994), were found to be in better physical condition and had better access to females for breeding than solitary males (Caro 1994, Caro and Collins 1987).

There is considerable variation in cheetah prey, ranging from Thomson's gazelle (*Gazella thomsoni*) on the Serengeti plains (Schaller 1968), impala (*Aepyceros melampus*) in Kruger National Park (Broomhall 2001, Mills and Biggs 1993, Pienaar 1969) to kudu (*Tragelaphus strepsiceros*), gerenuk (*Litocranius walleri*) and dik-dik (*Madoqua kirkii*) in the arid areas of northern Kenya (Hamilton 1986). Other species reported as prey include puku (*Kobus vardoni*), kob (*Adenota kob*) and oribi (*Ourebia ourebi*) (Nowell and Jackson 1996), springbok (*Antidorcas marsupialis*) (Mills 1990, Nowell and Jackson 1996, Smithers 1975), wildebeest (*Connochaetes taurinus*) (Eaton 1974, Skinner and Smithers 1990), hare (*Lepus spp.*) (Labuschagne 1979), and seasonally a large proportion of prey consumed consists of immature ungulates (Burney 1980, McLaughlin 1970). Additional prey species in the Sahara include dorcas gazelle (Gazella dorcas), hare (Lepus capensis), barbary sheep (Ammotragus laervia), feral asses (Equus asinus) and immature camels (Wacher et al 2005).

Cheetah's early association with humans

The earliest record of the cheetah's long association with humans dates back to the Sumerians, 3,000 BC, where a leashed cheetah, with what appears to be a hood on its head, is depicted on an official seal (Grzimek 1972, Guggisberg 1975). It was believed in Egyptian history that the cheetah would quickly carry away the Pharaoh's spirit to the afterlife (Wrogemann 1975)and symbols of cheetahs have been found on many statues and paintings in royal tombs (Guggisberg 1975).

Cheetahs were used for hunting in Libya during the reign of the pharaohs (Harper 1945). Cheetahs were not hunted to obtain food, but for the challenge of sport, known as coursing (Guggisberg 1975, Kingdon 1977). In Italy, cheetahs were coursed during the fifth century (Guggisberg 1975, Harper 1945). Russian princes hunted with cheetahs in the 11th and 12th centuries, and, at the same time, crusaders saw cheetahs being used to hunt gazelles in Syria and Palestine (Grzimek 1972). The best records of cheetahs having been kept by royalty, from Europe to China, are from the 14th, 15th and 16th centuries (Guggisberg 1975). Cheetahs also were used for hunting in Russia (Novikov 1956). Eighteenth and 19th century paintings indicate that the cheetah rivalled dogs in popularity as hunting companions (Wrogemann 1975).

During his 49-year reign as an Indian Mogul in the 16th century, Akbar the Great had more than 39,000 cheetahs in total, which were called Khasa or the Imperial Cheetahs, and he kept detailed records of them (Caro 1994, Guggisberg 1975). However, all the cheetahs kept for hunting and coursing purposes were taken out of the wild from free-ranging populations. Because of this continuous drain on the wild populations, the numbers of cheetahs declined throughout Asia. In the early 1900s, India and Iran began to import cheetahs from Africa for hunting purposes (Pocock 1939).

In Africa, the cheetah was important to many local ethnic groups: the San hunting communities of southern Africa ate cheetah meat for speed; traditional healers used cheetah foot bones for fleet-footedness; and kings wore cheetah skins for dignity (Nowell and Jackson 1996, Wrogemann 1975). These practices, combined with exportation to other countries, contributed to the beginning of the cheetah's decline in Africa.

2.1 Distribution (current and historical)

The cheetah was once one of the most widely distributed of all land animals (Wrogemann 1975). Through the course of time, the cheetah migrated over land bridges from North America into China, through Asia, India, Europe, and finally to Africa (Adams 1979, Kurten 1968, Kurten and Anderson 1980, Martin et al. 1977, Martin and Bateson 1986, van Valkenburgh et al. 1990), settling in its worldwide range as recently as 20,000 years ago (Adams 1979, Wrogemann 1975).

In 1900, approximately 100,000 cheetahs were found in at least 44 countries throughout Africa and Asia (Myers 1975, Figure 1.1).

Cheetahs have become extinct in the 20th century from large parts of their range in Southwest Asia and North Africa, and in these regions they are now restricted to small isolated populations (Nowell and Jackson 1996).

The current free-ranging African populations of cheetahs are found in small, fragmented areas spread in 29 African countries of North Africa, the Sahel, East and southern Africa (Marker 1998, Nowell and Jackson 1996, see Figure 1).

Current Range States are:

In Africa: Algeria, Angola, Benin, Burkina Faso, Botswana, Cameroon, Central African Republic, Democratic Republic of Congo, Egypt, Ethiopia, Gambia, Kenya, Libya, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Senegal, Somalia, South Africa, Sudan, Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe.

In Asia: Iran and possibly Pakistan.

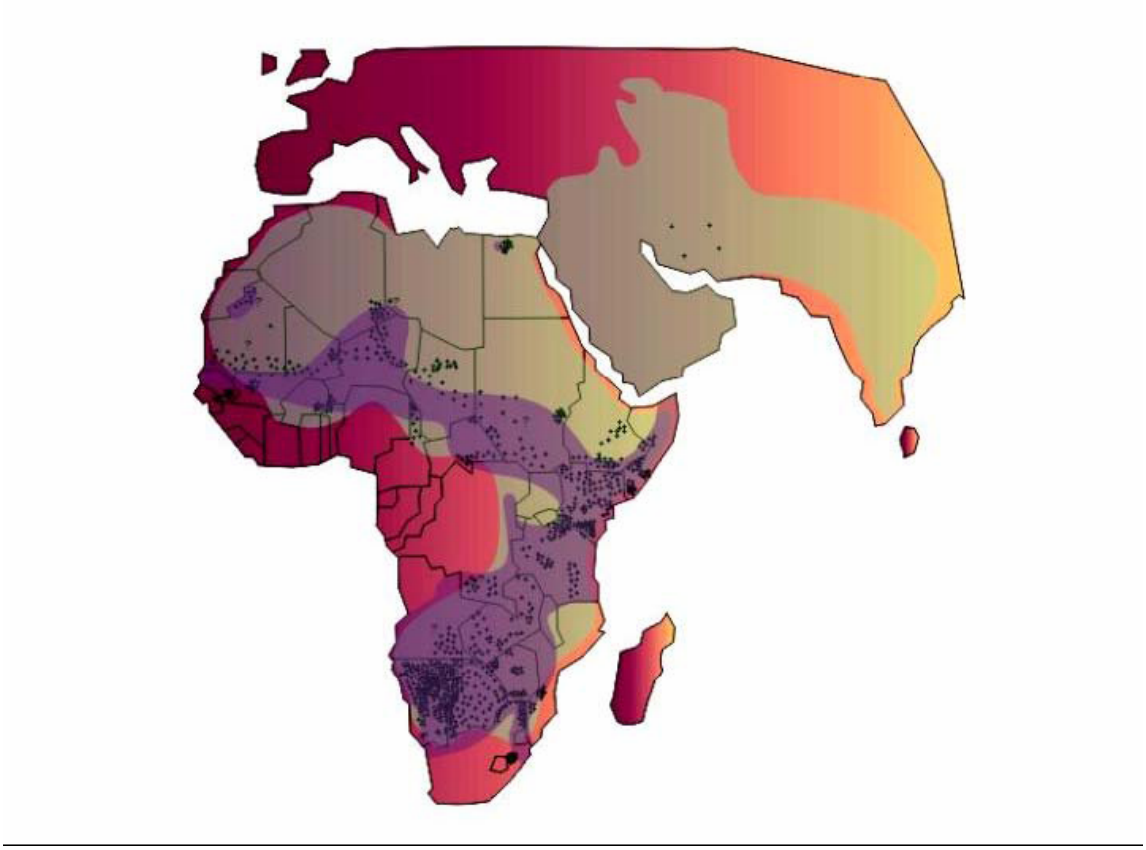

Fig.1. Distribution of cheetahs throughout Africa and Asia (in Iran) in 1900 (grey), showing 1975 range (purple) and current range (dots) (Marker 1998). Many remaining populations are trans-border.

2.2 Population

In 1900 there were 100,000 cheetahs in 33 African countries and 11 Asian countries.

In 1975 there were 30,000 cheetahs in Africa. Only 100 survived in Iran.

Based on estimates of density and geographic range (Nowell and Jackson 1996), the cheetah's total effective population size is estimated at below 10,000 mature breeding individuals, with a declining trend due to habitat and prey base loss and persecution, and no subpopulation containing more than 1,000 mature breeding individuals). This represents a decline of nearly 90% over the century (Marker 1998). In one century man has reduced the cheetah population to less than 10% of its original population.

Cheetahs are now **critically endangered** on a regional basis in Iran, where the population is estimated at approximately 50 mature individuals, found only in the Kavir desert region of Iran and possibly in the boarding areas of Pakistan. It is also critically endangered in North Africa, where no populations hold more than 50 mature individuals, with a total of approximately 250 individuals, and a declining trend.

Less than 10.000 adult cheetahs live in 29 African countries. But viable populations may be found in less than half of the countries where cheetahs still exist (Kraus and Marker-Kraus 1991, Marker 1998).

Current information about the status of the cheetah in many countries, especially countries that have been engaged in long civil wars, is lacking (Breitenmoser 1998, Breitenmoser and Breitenmoser 2001, Nowell and Jackson 1996). The information from North and West Africa is particularly limited, and the cheetah's future in these areas is questionable (Marker 1998, O'Mopsan 1998). The remaining strongholds are Kenya and Tanzania in East Africa, and Namibia, Botswana and Zimbabwe in southern Africa (Marker 1998). A summary of available information on the status of the species in individual range states is provided in the Annex.

2.3 Habitat

In Africa at least, until recently, the cheetah has generally been considered to be an animal of open country and grasslands. This impression is probably due to the ease of sighting cheetahs in the shorter grass, and the long-term studies conducted on cheetahs in East Africa (Caro 1994, Caro and Laurenson 1994, Schaller 1968). However, cheetahs use a wider variety of habitats and are often found in dense vegetation, e.g. the Kora Reserve in Kenya, Botswana's Okavango Delta, and Namibian farmlands (Broomhall 2001, Marker-Kraus et al. 1996).

In Asia and North Africa the habitat of *Acinonyx jubatus venaticus* consists of desert, much of it with precipitation of fewer than 100 mm per year. The terrain ranges from plains and saltpans to eroded foothills, and rugged desert ranges that rise to an elevation of up to 2,000-3,000 m. The vegetation, if any, consists of a sparse cover of shrubs, most less than one meter tall, of the genera *Salsola. Artemisia, Zygophyllum, Astragulus, Aphaxis*, and others. Gazelles were preferred prey but they have now become scarce through over-hunting and replacement by livestock.

Although the species tolerates a broad range of habitat types, its essential requirements for long term survival is for suitable prey and the reduction of conflict with humans and other large predators.

2.4 Migrations and/or transborder movements

Cheetahs have large home ranges on the order of 800-1,500 km² and are semi-nomadic, ranging widely to follow prey movements and avoid other large competing predators (Nowell and Jackson 1996).

There are clear and observed transboundary movements of cheetahs in several part of the Range.

3 Threat data

IUCN Status VU C2a(i) (2001).

3.1 Direct threat

Actual and potential threats

Cheetah numbers throughout their ranges are declining due to loss and fragmentation of habitat, and a declining prey base (Nowell and Jackson 1996). The Cheetah is threatened indirectly by loss of prey base through human hunting activities and directly because it is considered to be a threat to livestock. Livestock overgrazing has a negative effect on the habitat. Low population densities make cheetahs vulnerable to human induced threats (Nowell and Jackson 1996).

Intra-guild competition from more aggressive predators decrease cheetah survivability in protected game reserves, causing larger numbers of cheetahs to live outside protected areas and therefore coming into conflict with humans (Caro 1994, Marker 1998, Nowell and Jackson 1996). As human populations change the landscape of Africa by increasing the numbers of livestock and fenced game farms throughout the cheetah's range, addressing this conflict may become the most important factor in their conservation.

Cheetahs may suffer from the associated risks of low genetic diversity from a hypothetical bottleneck that occurred 10,000 years ago. A potentially critical factor for the long-term persistence of the cheetah is its lack of genetic variation relative to other felids. The genetic structure of the cheetah has received considerable attention over the past several years (Driscoll et al. 2002 (Driscoll et al. 2002, May 1995, Menotti-Raymond and O'Brien 1993, Merola 1996, O'Brien et al. 1985, O'Brien et al. 1987, O'Brien et al. 1983). It has been suggested that the genetic homogeneity could make the species more susceptible to ecological and environmental changes (Menotti- Raymond and O'Brien 1993, O'Brien et al. 1985, O'Brien et al. 1987, O'Brien et al. 1983). This has been interpreted in the context of two potential risks, including the expression of recessive deleterious alleles, and increased vulnerability to viral and parasitic epizootics that can affect genetically uniform populations (Brown et al. 1993, Evermann et al. 1988, Heeney et al. 1990, Munson et al. 1993, O'Brien et al. 1985). Given the lack of genetic diversity, monitoring the overall health of cheetah populations is an important component of understanding and promoting long-term viability (Munson and Marker-Kraus 1997).

A further concern is that cheetahs breed poorly in captivity (Marker 2002) and wild populations have continued to sustain captive ones. Until the 1960s, most cheetahs were imported from East Africa (Marker-Kraus 1997) but, as the numbers of cheetahs decreased in this region, Namibia became the major exporter of cheetahs (Marker-Kraus 1997). Today more than 90% of all cheetahs in captivity are descendants of Namibian cheetahs (Marker 2000, Marker-Kraus 1997). This additional pressure, together with ineffective captive breeding programmes, further endanger cheetah populations.

Over the past few years, the impact of infectious diseases on endangered species has become well known (Burrows et al. 1994, Munson et al. 1993, Roelke et al. 1993, Roelke-Parker et al. 1996). Cheetahs are known to be very susceptible to several feline diseases, and are possibly more vulnerable to such diseases due to the lack of heterogeneity in the population (Evermann et al. 1988, Munson 1993, Munson et al. 1993, O'Brien et al. 1985). In addition, captive populations world-wide have been known to have a high prevalence of unusual diseases that are rare in other species, and these diseases impede the goal of maintaining self-sustaining populations (Bartels et al. 2001, Munson 1993). Although the specific causes of these diseases

are not known, the character of these diseases implicate stress as an important underlying factor, and genetic predisposition and diet are possible confounding factors. While it is assumed that these diseases did not historically affect wild populations, there is concern that these diseases may arise in wild animals that are trapped, held in captive facilities and translocated.

Other threats

Severe habitat loss has occurred in this century with the growth and spread of human populations, settlement and activities. The relationship between farmer and cheetah has traditionally been one of conflict. Commercial farmers and ranchers have seen the cheetah primarily as a threat to livestock, especially to calves (Zimmerman 1996). While livestock losses result from many factors, including drought, reproductive failure, disease, injury, theft, and natural causes, farmers cite predation by jackal, caracal, leopard, and cheetah as significant. Elimination of predators became the accepted practice in many countries early farming years, when close monitoring and protection of livestock was impractical. Currently, when the cause of death of livestock is unknown, predators are often assumed to be responsible (Marker-Kraus et al. 1996). However, a survey of Namibian farmers conducted by the Directorate of Nature Conservation and Tourism (DNCT) from 1991-1993 indicates that ranchers' negative attitudes toward the cheetah do not necessarily correlate with actual cheetah predation of livestock (Morsbach 1986).

3.2 Habitat destruction

3.3 Indirect threat

3.4 Threat connected especially with migrations

3.5 National and international utilization

4 Protection status and needs

4.1 National protection status

The species is protected at the national level throughout most of its range (Nowell and Jackson 1996).

4.2 International protection status

All Cheetah populations are listed on the Convention on International Trade in Endangered Species of Fauna and Flora (CITES) Appendix I.

IUCN classification: (as of 2002)
Acinonyx jubatus jubatus : VU C2a(i)
Acinonyx jubatus venaticus: CR C2a (i); D
Acinonyx jubatus hecki: EN C2a, D

Only in two or three countries are cheetah populations considered only threatened and are killed legally if found to be in conflict with human interests. In 1992, at the CITES meeting,

quotas were set for export of 150 animals from Namibia, 50 animals from Zimbabwe, and 5 animals from Botswana, as live animals or as trophies16.

4.3 Additional protection needs

As reported throughout Africa, cheetahs are not doing well in protected wildlife reserves due to increased competition from other, larger predators such as lion and hyenas. Therefore, the majorities of the remaining, free-ranging cheetah populations are found outside of protected reserves or conservation areas and are therefore increasingly in conflict with humans. As human populations increase, the reduction of prey species available to cheetahs and the loss of habitat are the biggest threats facing the cheetah today. If these populations are to be protected, legislation must be reinforced and implemented, and education campaigns must be developed, on the model of what has been developed in Namibia.

There is a need to continue enhancing captive management to ensure optimal captive breeding. The implementation of management programs such as the African Preservation Program (APP) within the Pan African Association of Zoos, Aquariums, and Botanical Gardens (PAAZAB) are designed to facilitate cooperative management to the benefit of the population as a whole. As free-ranging populations of cheetahs continue to decline, and a large amount of genetic diversity of the wild population is lost, the captive and wild populations should be managed in cooperation. In the future, in the absence of further imports from the wild, the size of the world's captive population could be expected to decline, unless there is continued improvement in captive breeding efficiency. This trend, coupled with the continuing decline of the wild population, leaves the species extremely vulnerable. There is only one Asiatic cheetah in captivity, a wild-caught female in the Teheran Zoo.

5 Range States[1]

The African Range States are ALGERIA, ANGOLA; BENIN; Botswana; BURKINA FASO; CAMEROON; Central African Republic; CHAD; THE DEMOCRATIC REPUBLIC OF CONGO; EGYPT; ERITREA; Ethiopia; KENYA; Malawi; MALI; MAURITANIA; Mozambique; Namibia; NIGER; NIGERIA; SOMALIA; SOUTH AFRICA; Sudan; Swaziland; the United Republic of Tanzania; TOGO; UGANDA; Zambia; Zimbabwe.

In Southwest Asia, only a very small population remains in Iran (and possibly Pakistan?).

Cheetahs have become extinct in at least 18 countries in the very recent past (50-100 years): Djibouti, Ghana, India, Iraq, Israel, Jordan, Morocco, Nigeria, Oman, Saudi Arabia, Syria, Tunisia, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan. (Note: In the former Soviet Republics, considered extinct as of 1989. No confirmed sightings in the past few years. Cheetahs existed in many areas until the 1940's and 1950's when their prey, the goitered gazelle, was reduced drastically from over-hunting. Some cheetahs were believed to have moved down into Afghanistan when the goitered gazelles conducted a permanent move southward. In the 1960's and 1970's the last cheetahs existed in parts of Turkmenistan and Uzbekistan (east and west of Murgab, east of the Caspian sea, and in the Badkhyz Preserve). In these areas they lived mostly on remnant populations of goitered gazelle and arkhar sheep, saiga antelope, kopet-dag sheep and hares. In 1972 it was suggested that the cheetah be listed as a living monument and very strict international laws be proposed to save the last of the

[1] CMS Parties in capitals.

Asian cheetahs. There are proposals to reintroduce cheetahs into areas with sufficient prey populations such as the Ustyurt Plateau of Uzbekistan (Marker, 1998).

6 Comments from Range States

7 Additional Remarks

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ANNEX

Current status, Range State by range State:

1. Afghanistan: *Population*. No information at this time. Possibly still a few animals in the southwest above Baluchistan, Pakistan and the Iranian border region. There is no protection for cheetahs.
2. Algeria: *Population*. Still to be found in a few areas of southeast Algeria, between 3 1/2 E to the Libyan border and between 27 1/2 N to 20 1/2 N, with concentrations in Tassili N'Ajjer Range, Tassilis du Hoggar, Ahaggar, and Teffedest. Females with two cubs are seen regularly by tribesman complaining that cheetahs attack their camels. Rainfall was good from 1987-1990 in these areas, and there were increasing populations of Dorcas gazelle and Barbary sheep for cheetahs to prey upon. It is thought that the majority of the remaining Algerian cheetahs are living in the mountains of Tassili n'Ajjer and Ahaggar, because these areas are far more rich in water and vegetation. It is difficult to see the last Algerian cheetahs, native people know their presence mainly through their traces. This country could be a very important area for saving the North African cheetah. *Principal Threats:* conflict with nomadic herders and individual persecution by armed officials.
3. Angola: *Population*. No recent information due to the long-standing civil war. Estimate of 500 with a range of 200- 1000 animals. Range was confined to the drier, arid areas in the central and southern parts of the country. In 1975 cheetahs were reported in the following parks and protected areas: Iona National Park (14,500 Km2), Bicuar National Park (7,900 Km2), Cameia National Park (14,450km2), Luando National Park (8,280 km2), Quicama National Park. The cheetah was declared protected game in 1957, but legislation is difficult to enforce, and the military community is exempt from these provisions of the law. *Principal Threats*. Large scale poaching which has helped support the long, civil war, cultivation and overgrazing of cattle in the arid areas will contribute to the elimination of cheetah habitat.
4. Benin: *Population*. Thought to be extinct outside of the tri-country national park in the north of Benin, the Park Nationale du W, which adjoins Niger, Burkina Faso and Benin. In this park, a very small population of 2 or 3 pairs may exist. A few cheetahs exist in and around the Pendjari complex of protected areas in northwestern Benin. *Principal Threat*. Insufficient numbers of cheetahs to sustain a viable population and lack of habitat.
5. Botswana: *Population*. Estimates vary between 1,000 and 1,500. Cheetahs have a wide distribution throughout Botswana, but are absent from areas of dense human settlement in the extreme south. In the northern districts of Ngami West, Ngami East, and Tutume areas, the cheetah is found throughout and is often in conflict with communal farmers who graze livestock and the commercial farmers of the Botswana Livestock Development Corporation. Freehold lands make up a small percentage of the overall land base in Botswana, but appear to harbour relatively large cheetah populations. This is especially true in the commercial farming areas of Ghanzi district and the Tuli Block and communal livestock areas in the south central Ghanzi district. Cheetahs have been reported in the following protected parks and reserves: Chobe National Park (11,000 km2), Moremi Wildlife Reserve (3,880 km2), Nxai Pan National Park (2,100 km2), Makgadikgadi Pans Game Reserve (3,900 km2), Kalahari Game Reserve (24,800 km2). Cheetahs have been protected game since 1968 but can be shot for livestock defense even before any damage has been noted. Recent quotas set by CITES in 1992 allows for 5 animals for export. *Principal Threats*. Livestock farming and poaching.
6. Burkina Faso: *Population*. Extremely low. Estimated at 10. Perhaps only found, now, in the complex of national parks and protected areas and the tri-country national park in the eastern point of the country that borders Niger and Benin where 2 or 3 pairs exist. A few cheetahs exist in the Singou Fauna Reserve and the adjacent proposed Arli National Park.

Cheetahs may now be extinct in the vicinity of Kabore Tambi National Park and the Nazinga Game Ranch in southern Burkina Faso. The cheetah is totally protected but enforcement is likely to be inadequate. *Principal Threats*. The country is under growing invasion by large numbers of nomads from the north, which has increased the pressure on the cheetah's range. Loss of habitat, poaching and insufficient numbers of cheetahs to sustain a viable population.

7. Cameroon: *Population*. Population very small. In 1975, small populations of cheetahs were still found in Bénoué National Park. Between 1974 and 1976, a census was carried out in Bouba Nr'dijida National Park, which resulted in finding no cheetahs. *Principal Threats.* Decline of prey species, poaching and environmental degradation.

8. Central African Republic: *Population*. Still found in the southeastern area of the country, bordering Sudan and in the southern middle of the country, bordering Democratic Republic of Congo. A small population still existed in Saint Floris National Park boarding Chad and the hunting domains in the north. *Principal Threats*. Extensive poaching and limited prey species. *Taxonomy*. North Central African Republic listed as *A.j. soemmeringii*, there is no listing for southern Central African Republic.

9. Chad: *Population*. Possibly a very small population still exists in the Tibesti Highlands where prey species still are rather abundant, and there may also be a very small population in the Ennedi mountains. As of 1975, there was a small population of cheetahs in the Zakouma National Park. *Principal Threats*. Changing climate conditions have reduced the carrying capacity of the land and have over-burdened the sensitive environment. Currently, the many years of war have armed the general population, which puts all wildlife in danger of poaching for food and profit.

10. Democratic Republic of the Congo: *Population*. No current information. Estimated at 300 and could be below 100. Small populations found in parts of Shaba, Kasai and Kwango Provinces in the southern and southeastern part of country. Kundelungu National Park (7,600 km2) and Upemba National Park (10,000 km2) did contain a few cheetahs. *Principal Threats*. Agricultural development, poaching and loss of habitat. *Taxonomy*. There is no listing for the Northern Congo population.

11. Egypt: *Population*. Cheetah tracks have been seen and at least 5 animals were seen around the Sitra water source in the Qattara Depression in the western and northwest parts of the country, and north of Qara Oasis. It is believed there is still a small population that remains there. In 1994, tourism was banned in Marsa Matruh Province (where the Qattara depression is situated) for five years to protect wildlife from poaching. A proposed cheetah-gazelle sanctuary in northwest Qattara has been prepared. The cheetah is totally protected, although enforcement is likely to be inadequate. *Principal Threats*. Restricted habitat, possible conflict with nomadic herdsmen, and insufficient numbers of cheetahs to sustain a population.

12. Ethiopia: *Population*. In 1975 the population was estimated to be 1000 animals and it was believed that the populations could decline to 300 animals by 1980. The cheetah was widely distributed from Addes (?) to Djibouti in eastern Ethiopia. Also widely distributed through the southern parts of the country, between 200-1500m elevation, absent from the low lands of the Ogaden in the east, and no sightings in the north since 1937. A small population was known to be in the Danakil Reserve. In 1995, cheetahs were sited near Dolo. Two cheetahs were seen in the dry desert scrub, 100km from Dolo, by American oil company employees. The cheetahs were seen on a rocky plateau. This area has a fairly large antelope prey population. Other cheetah sightings have recently been in the Afder Zone, in and around the CherriHi/El Kere area, and in the Dolo region skins and live cheetahs are offered for sale. One cheetah from the Dolo region is in captivity at the Royal Palace as of 1996. Cheetahs are protected against hunting and capture although legislation is difficult to enforce. *Principal Threats*. Civil war, habitat loss, extensive poaching, decline of prey, and fur trade.

13. Gambia: *Population*. Reported that cheetahs may wander into Gambia from Senegal.
14. Iran: *Population*. Estimates of 30-60. Twenty years ago, the population was estimated at 400-450. As of 1998 cheetahs are still to be found in very small groups in a variety of areas of this large country. A relatively recent survey has been conducted by Hormoz Asadi showing 6 areas in the country where cheetahs still exist. 1.Evidence indicates definite dispersal of cheetahs from the Koshe-Yeilagh and Miandasht protected areas towards the southern Khorasan. The survey indicates that there are at least 15 to 20 cheetahs in southern Khorasan and groups of 5-8 cheetahs have been reported to be hunting wild sheep. 2. Cheetahs are surviving in the unprotected areas in Bafgh region of Yazd province. A protected area has been designated, the Kuh-E Bafgh PA. Much of this region consists of arid mountains and population estimates are still 10 to 15 animals including the Kalmand protected area. 3. A population is in the unprotected area of eastern Isfahan where the terrain consists of vast expanses of desert, unpopulated except for herdsmen grazing goats and camels. Here livestock numbers have increased and the past gazelle population has decreased, but this region may still support 5-10 cheetahs that are widely scattered. 4. A population is found in Kavir National Park and reports are frequent in this vast desert with arid mountains. The population corresponds with a gazelle population and there may still be 10 to 15 cheetahs here. 5. A population exists in the Garmsar, Damghan and Semnan unprotected areas in the northern part of the plateau. Here, 5 to 10 cheetahs are in conflict with growing agriculture and human populations. 6. A population is found in the Khar Touran National Park and protected area, which may possess the highest cheetah density in Iran. Cheetah reports are frequent in this vast expanse of desert where there may be 15 to 20 cheetahs still alive. *Principal Threats*. Loss of habitat, poaching, limited numbers of prey species. Direct persecution by humans, either shepherds or local hunters. They are easy targets for people in four-wheel drive vehicles and motorbike riders who chase cheetahs if they see them, causing them to die of exhaustion or leave the area.
15. Kenya: *Population*. Estimation of 1,200 animals. Species still occurs throughout the country, except in forests, montane moorland, swamps, and areas of dense human settlement and cultivation. Cheetahs are absent in western Kenya, the more densely populated parts of Central Province, and most parts of the coastal strip. Its distribution coincides with the distribution of Thompson's gazelle, Grant's gazelle, and gerenuk. Cheetahs occur throughout most of the arid northern and north eastern parts of Kenya. Although this area is vast and mostly unpatrolled and poaching is on the increase. Populations of cheetahs are found in the following national parks and reserves: Nairobi National Park (114 km2), Tsavo National Park (20,821 km2), Amboseli National Park (329 km2), Meru National Park (870 km2), Samburu-Isiolo Reserve (504 km2), Kora Reserve (1500 km2), Masai Mara Reserve (1510 km2), Marsabit Reserve (2088 km2), Tana River Reserve (165 km2). All hunting of cheetahs is completely banned. Exports of live cheetahs stopped in the 1960's. *Principal Threats.* Poaching, habitat loss, competition with agriculture and farming development.
16. Libya : *Population*. Cheetahs may still live around Fezzan oasis, SE of the country. Little information is available. Formerly found across the south of the country, but last seen in 1980, possibly still exist in the south west corner where the country borders Algeria, in the Tassili National Park. Until 1969 still found sparsely throughout the country except for the south and southeast. *Principal Threats.* Unknown, lack of information, presumed lack of prey species and habitat loss.
17. Mali : *Population*. Estimated to be 200 to 500, believed to be much less than this currently. Probably a small population still exists in the north west of the country bordering Mauritania and in the south part of Adrarh des Ifora mountains, where cheetahs have been reported in late 1970's. In 1990 skins were found for sale in Tibuta, north Mali. There were a

few cheetahs in Gurma National Park in the 1970's. *Principal Threats*. Decline of prey, poaching, environmental desiccation and reduction of habitat due to drought conditions.

18. Malawi: *Population.* Estimated at 50. Absent in southern part of the country. A small population still exists in the western parks and a few individuals around Chiperi area south of Kasurgu Park. Animals seen to be coming and going from Zambia into parks with very few resident individuals in Malawi parks. There have been sightings of individual cheetah in Nyika National Park (3134 km2), Vwaza Marsh Game Reserve (986 km2), and Kasunga National Park (2316 km2). *Principal Threats*. Human population growth, loss of habitat and poaching.

19. Mauritania : *Population*. Estimated at 100 to 500. Possible small population and isolated individuals still exists in Aouker Plateau, Mauritania Adghagh, at the NE of Banc d'Arguin National Park, in the northwest of the country (thought to be extinct due to the disappearance of their main prey, the Mhorr gazelle and decrease of dorcas gazelle) and Tidjika. No cheetahs exist in protected areas. *Principal Threats.* Decline of prey, poaching, environmental desiccation and reduction of habitat.*Taxonomy.* Northern Mauritania are *A.j. venaticus* and in the south, *A.j. hecki*.

20. Mozambique: *Population*. Estimated at 100. Once widely distributed, now relic populations perhaps survive in parts of Gaza and Inhambane Provinces and south of the Zambezi River, and in the southern regions of Tete Province. The Tete Region is believed to be absent of cheetahs now. The Gorongoza National Park (3,770 km2) had a small population of cheetahs. *Principal Threats*. Poaching due to civil war situation, lack of enforced protection.

21. Namibia: *Population*. Estimated at 2,000-3,000 animals. Still widely spread throughout the country, although only small populations are found in the southern part of the country due to small stock farming, jackalproof fences and eradication of predators. Ninety-five percent of the population is on commercial farmlands to the north of the Tropic of Capricorn. Apart from farmlands, very small numbers of animals still occur in communal farming areas of Damaraland, Hereroland, Bushmanland, and Kaokaland. Individual animals are seen in Kavango and Caprivi. Only two conservation areas have populations of cheetahs Etosha and the Namib/Naukluft, but only 1.4 to 4% of the population lives in proclaimed conservation areas. Possibly less than 100 animals live in the 2 conservation areas, Etosha National Park (22,270 km2) because high predator competition, and Namib/Naukluft National Park (49,768 km2), because of low prey density. Although protected game, cheetahs can be killed if livestock is threatened. In January 1992, at the CITES meeting a quota of 150 animals was given to Namibia for live export and trophy hunting. *Principal Threats*. Live capture and shooting by livestock farmers and game farmers. Cheetahs are easily trapped, in large numbers, on farms that have "cheetah play trees". The trapping is indiscriminate. These animals are then shot as there is little export market for live animals. The majority of the current world's captive population of cheetahs has originated from Namibia.

22. Niger: *Population*. Estimated at 50 to 40. Still found in the Niger Sahel running from Mali to Chad with concentrations of 10 to 15 pairs in the Air Tenere RNN (77,360 km2) in the northwest central park of the country. A few remain in the Termit Area. In Niger's Park W (the entire tri-country park is over 11,000 km2 of which Niger part is about 2,200 km2) in the extreme south west of the country bordering Benin and Burkina Faso there are still cheetahs. In a study between 1993 and 1995, 22 cheetahs were seen in this park in eight sightings with an estimation of at least nine cheetahs living in the park. *Principal Threats* . Poaching, lack of prey species, conflict with livestock. *Taxonomy. A.j. venaticus* in northern Niger and *A.j. hecki* in southern Niger.

23. Pakistan (Possibly Extinct): *Population.* Information collected suggests that there are no more cheetahs in northern Baluchistan from Quetta westward. This was thought to be the last

area claiming cheetahs in Pakistan. Possibly some still exist in southwest Baluchistan on the Iranian border. It is very difficult for Pakistan officials to get information from these semi-autonomous areas. Specimens of hides were collected in the early 1970's. There is a current proposal to conduct a survey in Baluchistan and the Nushki desert region close to Iran for the potential occurrence of the cheetah. *Principal Threats*. Loss of habitat, competition with livestock and poaching.

24. Senegal: *Population*. No current information. Possibly still a few animals in Parc National du Niokolo-Koba (8,000km2).*Principal Threats*. Lack of habitat.

25. Somalia: *Population.* Only proof of existence is from cubs being sold by locals in the Kismajo area. The situation for cheetahs in the country is at a critical point. They have been on the decline since the 1970's, in the north the records are old and not current and in the south of the country the civil war has caused an impact on the species. Estimated at 300. A traveler reported seeing eight animals in one days travel in the south of the country along the main road from Kenya, suggesting some numbers still occur in this region. Formerly found throughout the entire country, reduced by half to two thirds as of 1975. Previously found along the Ethiopian border in the north west and central areas of Somalia. Live cheetahs and skins for sale in Djibouti market place and thought to come from Somalia. *Principal Threats.* Civil war, agriculture expansion caused reduction of prey, and poaching for skins and live trade. Due to Shifta bandits and civil war, enforcement is inadequate.

26. South Africa: *Population.* Estimated at 500-800. Individuals occur sporadically in the northern parts of the Cape Province. In the Kalahari Gemsbok National Park there is a small population of approximately 50 animals. A small population is found on the extensive commercial farmlands in the north western, northern and eastern Transvaal, to the southern border of the Kruger National Park and along the Zimbabwe and Botswana borders. They were exterminated in Natal by the 1930's. Since 1965, 64 animals from Namibia were reintroduced to Hluhluwe/Umflozi, 33 into Mkuzi Game Reserves, 18 into Eastern Shores, 13 into Itala, and 14 into Ndumu and over 10 into Phinda. Other reserves contain isolated groups too small to be considered as viable populations. The population in the Kruger National Park is approximately 250 animals. Many cheetahs are imported to South Africa from Namibia for zoos, parks and private facilities, as well as for trophy hunting in small camps. South Africa does have several successful captive breeding facilities. Only two parks hold large enough populations: Kruger National Park (19,485 km2) and the Kalahari Gemsbok National Park (9,591 km2). The cheetah was taken off the South African endangered species list in 1989. Permits are issued to control problem animals through shooting and live capture. Trophy hunting is allowed, but there is no legal export of the trophy. *Principal Threats*. Livestock farming, small populations in unconnected conservation areas, and the believed success of captive breeding programs in South Africa, which has eliminated the need to put much effort into the conservation of the remaining wild populations.

27. Sudan: *Population*. Recent reports indicate that cheetahs are mainly distributed in Southern Sudan. Estimates are of 1,200 animals, which could have declined by half by 1980. Recent information in the north indicates that cheetah skins are used to make slippers and these are in great demand by rich Sudanese. Populations may still be present where adequate prey and livestock exist in semi-arid areas below the true desert in the central middle of the country. Widely distributed throughout the south, as of 1982. Recent information is lacking from the south of the country due to the long civil war. The population there could be greatly affected by the eight years of war. All wildlife has been severely affected by the availability of guns and ammunition. Were very rare or non-existent in all parks and reserves. Sightings of 10 animals in the southern reserve, Southern National Park (23,000 km2), sightings also seen in Boma National Park (22,800 km2), Boro Game Reserve (1,500 km2), Meshra Game Reserve (4,500 km2), Badingile Game Reserve (8,400 km2), Ashana Game Reserve (900

km2), Chelkou Game Reserve (5,500 km2), Kidepo Game Reserve (1,400km2), Numatina Game Reserve (2,100 km2), and Shambe Game Reserve (620 km2) (Hillman,1982). The cheetah has been a protected species since 1972. Effective 1 January 1989 Wildlife Conservation and National Park forces of Sudan issued a 3-year notice banning the hunting and capture of mammals, birds and reptiles in the Republic of Sudan. *Principal Threats.* Poaching, loss of prey, indirect affects of the long civil war in the south of the country.

28. Tanzania: *Population.* Estimated at 1000, with a range of 500-150062. Found in the grasslands of Masailand and a few localized areas of woodlands. Populations do exist in the Serengeti/ Ngorongoro Conservation Area (25,000 km2), possibly as many as 500, however, the population suffers due to competition with lions and hyenas. There have been sightings in Mikumi National Park (3,230 km2), Tarangire National Park (2,600 km2), Katavi National Park (2,250 km2), and Ruaha National Park (10,200 km2). *Principal Threats*. Poaching, predation and competition with other large predators.

29. Uganda: *Population.* Estimated less than 200. No current information available. Small numbers are thought to be found in the north east sector of the country and a few may still found in Kidepo National Park (1,400 km2). *Principal Threats.* Poaching and loss of habitat.

30. Zambia: *Population*. Although cheetah records are very scant, the species distribution in the last three decades is encouraging. The species is uncommon in many areas, however, as of 1969 cheetahs were still widely distributed in various parts of the country, but in low densities. Populations were concentrated in the flood plains and along dry riverbeds. It was thought that the majority of the suitable habitats would disappear by the 1980's. Recently cheetahs occur in relatively low numbers in Kufe National Park (22,400 km2), South Luangwa National Park and Sioma Ngwezi National Park. In Lower Zambezi National Park, one or two have been sighted by tour operators at Jeki plain since 199075. Experimental re-introduction of three male cheetahs into the Lower Zambezi took place in 1994. *Principal Threats*. Poaching, loss of habitat, and expanding human population.

32. Zimbabwe: *Population*. Estimated at 500-1000. A 1991 Department of National Parks and Wildlife Management (DNPWLM) report estimated cheetah numbers using a computer model. This model predicted there were over 600 cheetahs within the Parks and Wildlife Estates, nearly 200 in communal lands, 400 on alienated land and nearly 200 on other state land, resulting in a total of 1,391 cheetahs throughout Zimbabwe. These estimates should however, be treated with caution as they are not based on actual data. Farmers on private and commercial land in southern Zimbabwe have indicated an increase in the cheetah population and are concerned over the loss of valuable game and livestock to cheetahs. According to a 1997 report from the Ministry of Environment and Tourism DNPWLM, the amount of commercial ranchland with permanently resident cheetah populations has more than doubled in the last decade, with an estimate of 5,000 animals. Cheetahs are largely absent from the northeast part of the country. Two main populations are found in the southern commercial farming areas and in the northwest conservation areas. These two areas account for about 400 animals. The remainder of about 100 animals is distributed over the middle Zambezi Valley, the Midlands and Gonarezhou. Over 50% of the population occurs on privately owned farmland. Less than 200 animals are thought to be in the conservation areas including Hwange National Park (14,650 km2), Matetsi Safari Area (2,920 km2), Kazuma National Park (313 km2) and Zambezi National Park (564 km2). Occasional sightings are reported in Matobo National Park (432 km2) and 10-20 animals are in the National Park and Safari area around Lake Kariba Valley. Small numbers occur in the Mana Pools National Park (2,196 km2) and the lower Zambezi area, unknown number in the Gonarezhou National Park (5,053 km2). Cheetahs are on the sixth schedule of the Parks and Wildlife Act and are also specially protected, which means that it is illegal to kill a cheetah under any circumstance without a Section 37 permit. This includes trophy hunting a cheetah, killing one as a problem animal or

live capture. The Government opened trophy hunting on the cheetah in 1990, which is monitored by "hunting returns". Quota's set at the January 1992 CITES meeting allows for the export of 50 animals. *Principal Threats*. Conflict with farmers and livestock and illegal killing of cheetahs.

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

A. PROPOSAL: Inclusion of the West African manatee *Trichechus senegalensis* on Appendix I

B. PROPONENT: Governments of Togo and Niger

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammals
1.2	**Ordo**	Sirenians
1.3	**Familia**	Trichechidae
1.4	**Species**	*Trichechus senegalensis* Link, 1795
1.5	**Common name(s)**	West African manatee Lamantin ouest africain

2. Biological data

2.1 Distribution

The distribution of the species is limited to coastal waters, adjacent rivers and lakes of West Africa from the south of Mauritania to Angola and to the East inland as far as Mali, Niger and Chad (Powell, 1996). The species could have disappeared from certain parts of its original area of distribution. Certain populations are geographically isolated. More details concerning the presence of the species in every country of its distribution area are provided in the annex.

2.2 Population

There is no available global estimate on the population of the West African manatee (Powell, 1996). We know that a number of local populations have gone extinct. Yet, there is continued anecdotal reference to the occurrence of the species in the area of distribution. According to the Repertoire of Environmental Indicators of Sustainable Development and the Statistic Compendium of Benin (1999), the manatee population in Benin's waters was around 125 specimens; however, there is no factual evidence that can be used to determine the precise evolution of manatees in the country. In Cameroon the works of Grigione (1996) indicate that the species was still abundant in the country, without however specifying the size and trends of the population. In Côte d'Ivoire, according to Akoi (2004) the turbidity of the water and the vegetation on the riverbanks make any population estimate of manatees particularly difficult. There is currently no reliable data on the evolution of these populations. In **Gabon**, in light of the importance of freshwater bodies (nearly half of the country) one would expect manatee populations to be quite significant. In **Guinea**, little information is available on manatee populations. The only available data are from the works of Diallo *et al.* (1995) and Camara *et al.* (2000) and concern the National Park of upper Niger, where the population of the species

is estimated to be around 10 animals in a stretch of 80km of the Niger River. There are no data on the population trend. In **Chad**, a population of 13 individuals was recorded in the Doué region according to a census done by Salkind (1995). No data are available on population numbers and trends in the **Democratic Republic of Congo, Gambia, Ghana, Guinea Bissau, Liberia, Niger, Nigeria, Sierra Leone, Senegal** or **Togo.**

Overall, in all countries of the range the trend is towards a reduction of the populations. The species meets the IUCN criteria for the category VULNERABLE (a reduction of at least 20% over the course of 10 years). The population decline has been attributed primarily to hunting and accidental entanglement in fishing nets. More details concerning population numbers in each country of the area of distribution are provided in the annex.

2.3 Habitat

This species occupies the coastal zones, lagoons of estuaries, the big rivers from brackish to fresh water, fresh water lakes and the upper parts of rivers upstream from waterfalls (Powell, 1996). The main rivers, in which the species is found, are the following (from north to south): Senegal, Saloum, Gambia, Casamance, Cahacheu, Rio Mansoa, Rio Geba, Rio Grande de Bulba, Rio Tombali, Rio Cacine, Kogon, Kondoure, Sierra Leone, Grandes Scarcies, Petites Scarcies, Sherbro, Malem, Waanje, Sewa, Missunado, Cavally, Saint Paul, Morro, Saint John, Bandama, Niouniourou, Sassandra, Bandama, Comoe, Bia, Tano, Volta, Mono, Oueme, Niger, Mekrou, Benue, Cross, Pie, Katsena Ala, Deb, Okigb, Issa, Bani, Akwayafe, Rio del Rey, Ngosso, Andokat, Mene, Munaya, Wouri, Sanaga, Faro, Chari, Bamaingui, Bahr-Kieta, Logoné, Mitémélé, Gabon, Ogoué, Lovanzi, Kouliou, Congo, Loge, Dande, Bengo and Cuanza. Manatees are also found in the lakes of these river systems. The lakes and the West African lagoon systems in which populations of manatees are found are among others: Lake Nokoé (Benin), Conkouati lagoon and Lake Nanga (Republic of Congo), the lagoon complexes Aby-Tendo-Ehy, Ebriè east and west and Tagba-Makey-Tadio-Niouzoumou and the N'gni lagoon (Côte d'Ivoire), the Lake Volta (Ghana), Léré and Tréné lakes and lake Togo (Togo). Other lakes and lagoons harbour populations of the West African manatees within its distribution area, notably in Cameroon, Gabon and in Nigeria, which have not been reported in this work.

The fundamental conditions related to the presence of the West African manatee are freshwater habitats offering abundant food resources. These are essentially coastal habitats with the following optimal conditions: a) coastal lagoons with abundant mangroves or herbaceous plants; b) estuaries of big rivers with abundant mangroves (*Rhizophora racemosa*) in the lower part and herbs, especially *Vossia* and *Echinochloa,* in the upper part; c) sheltered shallow coastal waters (less than three meters of depth) seamed with mangroves or marine macrophytes, especially *Ruppia*, *Halodule* or *Cymodocea* (Powell, 1996). When the level of rivers undergoes seasonal variations, the preferred zones are those which give access to deep ponds or which connect lakes, providing a refuge during the dry season, as well as the flooded parts of swamps or forests according to the seasons with herbs and reeds, especially *Vossia*, *Echinochloa* and *Phragmites*. In the archipelago of Bifagos (Guinée-Bissau), the marine zones where manatees occur are characterized by freshwater infiltrations and ponds, with temperatures of 18ºC or more.

2.4 Migrations

Seasonal movements, in response to changes in the water level which influence the availability of food and /or the salinity of the water, have been reported in several regions, especially between the river Senegal and the Lake Guier, between the Niouzomou lagoon and the river Niouniourou, and up and downstream of the rivers Gambia, Waanje and Shewa (Powell, 1996). Movements over shorter distances (less than 20 km) have also been recorded. Seasonal migrations have been observed between Mali and Niger, and between Niger and Nigeria along the river Niger, between Senegal and Gambia in the upper part of the river Gambia, between Senegal and Mali along the river Senegal and between seasonal wetlands of Mauritania and Senegal (unpublished data, pers. comm. *in* Powell, 2000). Movements of manatees between waters of Côte d'Ivoire, Ghana and Liberia have also been noted (Akoi, 2000). In the course of their movements manatees can cross frontiers and also move from one country to another along the coast.

3. Threat data

More details concerning the threats that weigh upon the species in each country of its distribution area, are provided in the annex.

3.1 Direct threat

Unregulated and probably unsustainable hunting should be considered the main threat to the populations. Despite legal protection, the manatee is still hunted in its entire distibution area for its meat, skin, oil and other organs, by means of harpoons, traps, nets and rods (Powell, 1996; Reeves and *al*., 1988; Roth and Waitkuwait, 1986; Akoi, 1992). In Benin, Cameroon, Gambia, the Democratic Republic of Congo, Mali, Senegal, Chad and in Togo, the oil is used for medical and cosmetic purposes (Powell, 1996; Chikou and al., 2002; Segniagbeto and al., 2004). In certain regions of the distribution area (Benin, Guinea, Nigeria, Togo), other organs of the animal like the male genitals, the ribs, the liver, the bile, etc. are used in traditional religious rituals or in traditional pharmacopoeia. In most of the traditional communities of the species' range, hunting is highly traditional and ritualized and the meat is consumed locally. In other regions however, hunting is more occasional and meat is commercialised locally and amongst tribes. Generally, despite all the traditional practises connected to the hunt of the manatee, the populations of the species continue to decline in the whole distribution area. In certain countries progress has been made in discouraging hunting, but actual protection is marginal and hunting continues. Few data exist on trends in captures, but the general tendancy is towards a decline of the populations of the species. For instance, according to Powell (1996) in the 1930s, 12 individuals were taken in a day over the distance of 100 miles in the river Gambia, while only 2 individuals were captured per year in the same region from 1978-1983.

In certain areas, conflicts between man and manatees have been noticed. In particular, the manatees are considered as destructive pests in certain cultivated and fishing areas, for example in Sierra Leone (Reeves *et al.* 1988). They feed on rice and other harvests and eat small fish captured in the nets. This can lead to the elimination of the animals. Unfortunately, no data is available on the impact of these eliminations.

It is also known that manatees are accidentally caught in shark nets (notably in Senegal (Cadenat, 1957) and in Sierra Leone (Reeves *et al*., 1988)), in trawl nets, fixed nets and in reservoirs (Powell, 1996). They are also occasionally killed in turbines or dams. The skeletons of six manatees were observed at the same time downsteam from the Kainji dam, in Nigeria (Powell, 1996). There is no estimation of accidental death rates in fisheries or dams.

3.2 Habitat destruction

Coastal wetlands, which are the main habitat of the manatee, are exposed to numerous threats leading to their progressive disappearence. In all range states of *T. senegalensis*, demographic pressure on the coastal zone is very important. High population densities, ranging between 200 to 500 habitants/km^2 , are recorded in coastal areas. Space occupation and high population density are not without effects on natural habitats. Particular ecosystems such as mangroves forests of *Rhizophora racemosa* and *Avicenia spp.* are regularly exploited for firewood and lumber. This situation contributes to the destruction of the mangroves in Côte d'Ivoire (Nicole *et al*., 1994), in Ghana (Saenager and Bellan, 1995), in Benin (Baglo, 1989), in Togo (Afidégnon, 1999) and in all coastal countries of the distribution area. The destruction of mangroves and of forest ecosystems upstream favours the siltation of the lagoons and the estuaries. This leads to the disappearence of the refuge zones for the species in watercourses, lakes and lagoons of West Africa. The reduction of waterfloods, due to the construction of dams, causes a reduction of the amount of freshwater reaching estuaries and a general increase of salinity, which affects the growth of the vegetation. Similar destructive pressures on coastal wetlands are being observed throughout West Africa. Inland, the construction of dams has an effect on the number and quality of manatee river and lake habitats, but these effects have not been evaluated.

Contrary to the human activities destroying the habitats of manatee, the species itself plays an ecological role in the maintaining of its ecosystem. For instance, due to their feeding behaviour, the manatees can be used as means of controlling bad floating plants. The research of Allsopp (1960) and Maclaren (1967) on individuals in semi-captivity, confirmed this ecological role of the species, and also a role in mosquito control. It seems that the most important ecological role of the manatee is the recycling of nutrients, thus encouraging primary production (Best, 1982; Domning, 1992). Recent studies have shown that the manatees can serve as an indicator of the « health » condition of the ecosystems on which they depend (O'Shea *et al.,* 1991; Domning, 1992; Trainer & Baden, 1999; Bossart *et al*., 2002; Robert *et al*. 2004). In the specific case of *T. senegalensis*, what could be its role in the habitats in its area of distribution ? We presume that the consumption of *Pistia stratoites, Echornia crassipes* and other species of coastal and continental wetlands could constitute a way to fight against these invasive floating plants.

3.3 Indirect threat

Coastal wetlands throughout West Africa are invaded by booming human populations. For example, the costal wetlands of the Côte d'Ivoire represent only 1% of the counry but are occupied by 25% of its population (Nicole *et al*., 1994). A similar situation can be encountered in all the countries of the region. In Benin, wetlands make up the entire coastal region and according to a report of the Ministry of Planning in 1994, this zone concentrates more than 53 % of the national population, while representing only 1/10 at the surface of the country. The increase of the population and its settlement cause an increase of effluents in streams and estuaries. In several countries of the region, UICN indicated in 1993 that

discharge of untreated industrial waste in the waters was on the rise due to the scarcity of waste treatement plants and an increase in the use of uncontrolled chemical substances in agriculture. In certain regions such as Côte d'Ivoire, destructive fishing methods such as poisoning of water, which modifies the environment by an excessive salinity, are regularly used. What are the impacts of this pollution on the health and the habitat of the manatees? We presume that the effects of these pollutions have consequences on the reproduction and the survival of the species.

3.4 Threats connected especially with migrations

The increase of salinity or the reduction of the flux of waters as a consequence of manipulations or growing needs in water resources can cause the manatees to get stranded or to leave a given zone with unknown demographic results (Powell, 1996). Similar observations have been made in the river Mono between Togo and Benin as a consequence of the construction of a dam in Nangbeto (Dossou-Bodjrenou, 2003). The ecological impacts of the construction of this dam on the habitat of the manatee are still to be determined. The fishermen indicate that certain deep zones in the Mono, which served as refuge habitats for *T. senegalensis,* have disappeared, facilitating the hunt in the low tide period. Since the construction of this dam, with the almost permanent unidirectional flux towards the sea, these zones fill up with sediments, hence depriving the manatee population of its habitat. Therefore the migratory behaviour of the species in Mono is disturbed, with individuals sometimes finding themselves in the sea at the river mouth named « Bouche du Roy » in Benin. In Guinea, infrastructures such as the ferry of the Fatala and the installation of the bridge had had consequences on the habitat and the migrations of the species in the estuary of the Fatala. In Gambia in 1993, at Sami Wharf Town, the construction of a bridge in the Upper River Division Bank, would have led to the capture of many individuals of the species, which gathered around the dam.

3.5 National and international utilisation

The manatee is fully protected in most of the countries of its distribution area. Despite this protection status, manatees are hunted and exploited by local communities to nourish families and for local business (meat, oil and other organs). Manatees are entering the international trade markets. An aquarium in Japan purchased two manatees in Guinea-Bissau in 1996 (Asano and Sakamoto, 1997), and manatees were being sold on the internet by Guinea-Bissau in 2000 (Anon., 2000). It is known that manatee meat and oil are traded illegally between Chad and Cameroon (Powel, 1996).

4. Protection status and needs

Details on the protection of the species in each country of the distribution range of the manatee are provided in the Annex.

4.1 National protection status

The West African manatee is protected by national legislation in most of the countries of its distribution range. However, the application decrees that should follow such legislation are

either inadequate or are not implementedin the field. In some cases the oppressive character of the implementation of legislation by state agents for wildlife protection have a negative impact on the conservation of the species, to the extent that often such situation lead to poaching beyond control.

4.2 International protection status

The species is classified as VULNERABLE on the IUCN Red List (due to a decline of 20% in abundance over the course of 10 years) and is listed in Annex II of CITES and Appendix II of CMS.

4.3 Additional protection needs

In certain regions of the manatee distribution range, there are still sizeable populations of the species. In these regions, education of the public and resource management programmes need to be strengthened with a view to raising public awareness of conservation issues and finding a way of stopping or at least reducing excessive hunting. Powell (1996) has identified eight crucial manatee conservation zones on the basis of the degree of the threat to the population of the species in those zones, the existence of a sufficiently important population of manatees or a site where the institutional framework would facilitate the implementation of a species conservation programme. In addition to Powell's work (1996), a synthesis report on the state and strategies of West African manatee conservation was finalised in June 2007, which provides details on the most important sites hosting sizeable manatee populations in West Africa. These are:

(1) Lake Volta, Ghana
(2) Lake Togo, Togo
(3) The complex of Ouémé, Benin
(4) Lagoon N'Dogo, Gabon
(5) Lagoon of Conkouati, Republic of Congo
(6) Fresco, Nioumozou, Lagoons Tadio Comlex, Ivory Coast
(7) Archipelago of Bijagos, Guinea-Bissau
(8) River Casamance, Saloum Delta National Park, Djoudi National Park and Lake Guier, Senegal
(9) Lake Léré and lake Tréné, Tchad
(10) Inland waters of Débo delta and lake, Mali
(11) Lake Ossa and river Sanaga, Cameroon

In order to make the population aware of the threats on the manatees, it is important to elaborate a regional programme of sustainalbe conservation of the West African manatee and its habitat, based on the most reliable scientific data and taking into account the environment and the socio-economic and cultural characteristics of local communities in the distribution area.

5. Range States[1]

ANGOLA, BENIN, CAMEROON, CONGO, CÔTE D'IVOIRE, DEMOCRATIC REPUBLIC OF CONGO, GAMBIA, GHANA, GUINEA, GUINEA-BISSAU, Equatorial Guinea, LIBERIA, MALI, MAURITANIA, NIGER, NIGERIA, SENEGAL, Sierra Leone, TCHAD, TOGO, and possibly BURKINA FASO.

6. Comments from Range States

At the negotiation meeting of an instrument under the aegis of CMS for the conservation of West African manatees and small cetaceans of Eastern Atlantic Basin (Adeje, Tenerife, octobre 2007), all representatives of the countries of the distributon area of the West African manatees, supported the submission of a proposal for the inclusion of the species on Appendix I of CMS. Togo and Niger were tasked with the preparation and the formal submission of the proposal. The present proposal is the result of the efforts made by CMS Parties with a view to the listing of theWest African manatee on Appendix I.

7. Additional remarks

To respond to the demands coming from the supporters of the conservation of West African manatees, Wetlands International organised a regional meeting in 1998, in which 20 countries participated (Dodman, 1999). It was decided that measures should be taken to avoid the disappearence of the species from African waters, and a research and education programme was launched which included preliminary investigations in the entire region. In recognition of the efforts made, in 2005 at the seventh conference of the Parties to the Abidjan Convention, the participants expressed the need to establish new partnerships for the conservation of migratory species like the manatee. In December 2006, a regional workshop was organised in Dakar and succeeded in developing a preliminary strategy for the conservation of the species.

Within the framework of CMS, the nineth meeting of the Scientific Council in 1999, had noted that the West African manatee was the most threatend of all species of manatee and had proposed to consider it a species requiring conservation measures (UNEP/CMS/ScC.9/Doc.10, p.9). It was decided that the situation of the species would have been reviewed at a workshop on small cetaceans of West Africa. The workshop took place in Conakry, Guinea, in May 2000 (Anon, 2000). This workshop compiled the first data on the species provided by CMS experts.

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ANNEX

Habitats, threats and conservation initiatives relating to the West African manatee

Mauritania

Habitats: They are located in the far south of the country, in the Senegal River basin. Individuals have been spotted in Diawling National park. Threats: The main threat is accidental bycatch in fishing nets. Changes and destruction of habitat are also significant threats. Conservation initiatives: Mauritania has ratified all international conventions that protect the manatee, but no initiative has been launched in the field. Neither has a national legislation for the protection of the species been put in place.

Senegal

Habitats: They are spread out between the Senegal, Sine Saloum and Casamance rivers and their adjacent wetlands, particularly in the Guiers Lake and the Tahouey canal. Threats: These include illegal hunt in Saloum delta, where it ties in with rituals that are a mix of sacred baths and incantations. Above all it is the construction of dams that poses a serious threat to manatees in Senegal. Individual specimens are accidentally but regularly caught at dams' openings (such as the Tauoé dam on Guiers Lake). Manatees caught at the openings are injured and usually end up dying. Loss of habitat due to shrinking water levels, impacts of drought, uncontrolled exploitation of mangroves, siltation and pollution also seriously affect the survival of the species. Conservation initiatives: Local initiatives have been developed with support from partners (Wetlands International, IUCN, UNESCO and BREDA) for the conservation of the manatee. Senegal has a hunting code in place that protects the West African manatee. It is also a Party to various conventions that protect the species: CITES, CMS, CBD.

Gambia

Habitats: Manatees are found primarily in the central part of the River Gambia, the Banjul-Kaur-ur zone, the main river bed (from Temdaba to Bai Tenda) and the coastline. Threats: The biggest threats are habitat loss for the species due to the destruction of mangroves and receding water levels since droughts in the 80s. Hunt is also present and was intensified since 1990. Conservation initiatives: No conservation initiatives for the species have been undertaken in Gambia. The Wildlife Conservation Act of 1 February 1977 addresses the conservation of the species. Gambia is signatory to international conventions (CITES, CMS, Ramsar, CBD) which protect the species.

Guinea Bissau

Habitats: The entire coastal zone of Guinea Bissau serves as a habitat for the West African manatee, according to observations of Da Silva *et al*. (1999). The most frequent observation zones are the Bijagos Archipelago with the Orango National Park, the River Mansoa and the various wetlands associated with the river Cacheu. Threats: Guinea Bissau is the country of the region, where manatee hunt is at its highest. According to Da Silva *et al*. (1999), 209 manatees were killed in the period of January 1990 to May 1998, i.e. 25 per year. Bycatch in fishing nets is the most common cause of death. The observations of Da Silva *et al*. (1999) were also made by Powell (1996), in all sites considered as habitat for manatees in the country. Conservation initiatives: The creation of a Biosphere Reserve in the Bijagos Archipelago has been instrumental to the reduction of accidental bycatch of the species. The species has been registered as threatened in the country and manatee hunt is illegal. Awareness campaigns targeting the Bijagos communities have been conducted. Guinea Bissau is member of all international conventions that protect the species (CITES, Ramsar, CMS and CBD).

Guinea

Habitats: The habitat of the manatee in Guinea is constituted of a vast system of estuaries (those of the Forecarah region) and rivers (Kogon in the region of Boke and river Konkouré around Dubréka and Boffa). The coastal main pools of High Niger (on the river Tinkisso), the river Gambia, the river Senegal, the estuary of Soumba, the estuary of Konkouré, the estuary of Fatala, Rio Komponi, Rio Nunez and border zone of the Guinean coastal south, notably in the estuaries of Benty constitute the habitat of the species. Threats: According to Akoi (2000), the main threats to the manatees in Guinea are by-catch in the rivers, the modification and the destruction of habitats through the destruction of mangroves, the construction of dams and bridges over the rivers. According to Richard (2007), 39 individuals were killed in different regions of the country and 9 individuals died on the banks of watercourses, following fluctuations of the water level. Conservation Initiatives: In Guinea, the code for the protection of wild fauna and the regulation of the hunting of February 15th, 1990 addresses the protection of the manatee. The species appears on the list A of annex 1, which includes the species completely protected on the entire national territory. In Guinea, four conservation programmes were initiated for the West African manatees between 2002 and 2007, of which some are under way.

Sierra Leone

Habitats: They are constituted of the coastal fringe with mangrove forests according to Revees *et al.* (1988). They are also well represented in the estuaries of the river Sierra Léone, at the level of both Scarcies, in Yawri Bay and in Shrebo Islands. Threats: In Sierra Leone the number of manatees also diminishes (Reeves *et al.,* 1988; Powell, 1996). The species is overhunted and commercialised, because it provides excellent nourishment and because the rice farmers and the fishermen consider the animal as a destructive pest. At the end of the 1980s there were still many manatees in the country but at that epoch, catches were considered excessive. The animals are trapped by nets and harpooned. There are concerns about the effects of modern fishing devices on the manatees, which are easily caught in mono-fibre nets. Conservation initiatives: In 2000 the manatee was inscribed on the list of species completly protected at national level. Studies are under way and in 2003, a National Strategy and an Action Plan on Biodiversity was drawn up and the manatee was identified as a species, for which a management plan had to be initiated. The Sierra Leone Conservation Society is currently undertaking investigations on the status of species with wetland funds. Sierra Leone signed international conventions which protect the manatee: CITIES, CMS, Ramsar, CBD.

Liberia

Habitats: The manatees are found in the main rivers of Liberia notably in the estuaries of river Cavalla in the south-east region of Piso and the eastern lake (South Liberia), including in the envisaged National Park of Cestos-Sankwer and in the region of the lake Piso (Powell, 1996). Threats: They are represented by the hunt for the consumption of the flesh and for use in pharmacopeia (traditional treatment), bycatch in the nets of fishermen, wounds caused by nautical devices, the fragmentation of the habitat which can isolate the manatee from some vital biotopes and the siltation of watercourses, notably resulting from deforestation and from desertification upstream. Conservation initiatives: the protection of the manatees was taken into account in the national legislation to regulate the exploitation of fishing and coastal resources. This legislation had established a list of species in danger, which included amongst others manatees, turtles, dolphins, hippopotamuses and whales. Liberia is signatory of CITIES, CMS, CBD, Ramsar. The National Agency for the Protection of the Environment initiated activities towards the protection of species consisting of the collection of information and awareness of local communities.

Côte d'Ivoire

Habitats: Akoi (2004) identified manatee habitats in Côte d'Ivoire. They are constituted of the lagoon complexes of Aby-Tendo-Ehy with the estuaries of rivers Tanoh and Bia, Ebriè and with the mouth of

the river Comoé, from west Ebrié with the mouth of the river Agneby, from Tagba-Makey-Tadio-Niouzoumou with the mouths of the river Bandama and of rivers Gô and Boubo, of the lagoon Not gni with the mouths of rivers Bolo and Niouniourou and finally of the mouth of Sassandra, San Pedro river and Cavally. Threats: In Côte d'Ivoire, in the mid-eighties, the number of manatees was reduced by hunt to 5 or 6 small isolated populations with a total estimate of less than 750 animals. Hunt is illegal but it persisted at the end of the eighties with traps, harpoons, hooks as well as hooks and lured nets (Roth and Waitkuwait, 1986; Nicole *et al.,* 1994; Powell, 1996). The destruction of the mangroves and the construction of dams on rivers such as the Kossou dam on Bandama and the Buyo dam on Sassandra, and pollution also constitute serious threats to the species. Conservation initiatives: A reasearch and training programme began in 1986, backed by the Wildlife Conservation Society. The species population in 2000 was estimated to number 750-800 individuals (Akoi Kouadio, comm. pers.). Education programmes were established and were successful towards stopping potential hunters and in strengthening the ban to hunt in some regions, with the help of the Wildlife Conservation International (Akoi, 2000; Anon., not dated). A Conservation Plan is under development (Akoi, 2000). In Côte d'Ivoire the species is fully protected by the code of legislation on hunt and protection of nature (Law 65-225 of August 04th, 1965: fully protected species on appendix I, class A). Côte d'Ivoire is signatory of international conventions which protect the West African manatee: CITES, Ramsar, CBD, CMS.

Ghana

Habitats: the habitats of the West African manatees (*Trichechus senegalensis*) in Ghana are localised in the internal and coastal marshes, especially in the Afram arm of lake Volta , in rivers Dayi, from Asukawkaw, from Obusum, from Sene, from Digya and from Oti. They are also found in river Tano, lagoons and marshes linked to the lower Volta. Manatees were also reported in the tributary of the river of Tordzie, such as Loli, Atra and Hlortor in the south zone of Tongu. Threats: They mainly concern hunting with harpoons. A slaughter of seventeen individuals in the river Afram was reported (Ofori-danson and Agbogah, on 1995). Bycatch in the rivers of the country is also noteworthy. Threats also concern the loss of habitats by the pollution of watercourses. Conservation initiatives: In Ghana, the manatee is entirely protected by law L.1.685, 1971 (acte 43). Hunt, capture and destruction of its habitat, are officially forbidden. Ghana is signatory of all international treaties carrying on the conservation of the species (CMS, CITES). No initiatives specifically aiming at the conservation of manatees have been undertaken in Ghana. Nevertheless NGOs such as GWS, Friends of the Earth, GEO, contribute to the conservation of natural resources including the manatee.

Togo

Habitats: In Togo, the populations of manatees concentrate in the lake Togo with its tributaries which are the Haho and Zio rivers. More or less isolated individuals are found in the river Mono shared by Togo and Benin. Threats: They concern mainly hunt in lake Togo. Segniagbeto *et al*. (2004) pointed out that sixteen (16) skulls were counted at a hunter's in the only village of Dékpo located on the west bank of the lake. Threats also concern the loss of habitat with the destruction of the formations of vegetation which constitute the banks of watercourses and the lake. The construction of the Nangbéto dam on the Mono river constitutes a serious obstacle for the displacement of the species, coupled with an increasing siltation of the habitat. Conservation initiatives: In Togo, the basic text dedicated to the conservation of wild fauna is the prescription n°4 of January 16th, 1968. However, the manatee does not appear on list of protected species linked with this prescription. Togo ratified all international conventions which protect the manatee: CITES, CMS, Ramsar and CBD. Conservation initiatives were undertaken in 2003 by the NGO AGBO-ZEGUE aiming at raising awareness of the local communities in the main sites of the species.

Benin

Habitats: In Benin, the habitats of the West African manatee are found in the Ouémé valley with the lagoon of Porto Novo and the lake Nokoué, in Mono where refuge zones provide shelter for some

individuals and in the Niger valley in the North. Threats: Threats to the manatee in Benin concern hunt. No figures are available but the general trend is toward a reduction of populations in the different sites. Threats also concern the loss of the habitat with the destruction of mangrove swamps, especially in the south. They also note increasing pollution of the coastal wetlands of Benin. Conservation initiatives: The manatee is governed in Benin by the law n ° 87-014 of September 21st, 1987, which regulates nature protection and hunting. The decree N ° 90-366 of December 4th, 1990, which provides practical details for the application of the law of September 21st, 1987, classifies the manatee among the species which are fully protected. Benin is signatory of international conventions which protect the manatee: CITES, CMS, Ramsar, and CBD. Locally, NGOs such as Tropical Nature NGO lead actions in favour of the conservation of the species.

Nigeria

Habitats: According of Sykes (1974) they are represented by the Bénoué and Niger rivers and their tributaries. Powell (1986) indicates that manatee populations can be found along the Nigerian coast and especially in the Niger Delta where they are widespread. Happold (1987) mentions the sites of Bussa, Ekuri, Lake Kainji, Makurdi, Mutum Biya Game Reserve, Numan, Lake Oguta, Pategi, Shangunu and Yola as being the main habitats of manatee in Nigeria. Manatees are also present in the lake Kainji which provides new habitats after the creation of the Kainji dam according to Nishiwaki *et al.* (1982). Threats: According to Obot (2002), the main threats to the species are: the destruction of its habitat, by-catch in fishing nets, illegal hunt, seasonal hunt (visitors coming from a distance to go hunting in the dry season), wounds caused by fishing boats, reduction of the volume of water in the Niger, festival of traditional hunt targeting the animal, etc. Conservation Initiatives: There is no specific legislation governing the protection of species in Nigeria. However, the country is signatory of international conventions which protect the species (CITES, CMS, Ramsar, CBD). The Nigerian Conservation Foundation (NCF), collaborates with the federal ministry of environment for the conservation of this species and biodiversity in general.

Cameroon

In Cameroon, according to a survey supported by WWF-USA and the Wildlife Conservation Society in 1989 (Grigione, 1996), manatees are still numerous in some regions. They are present on the whole of the littoral zone. They are principally signalled in mangroves and estuaries of the Ndian Delta, in the region of Bakassi and in the river Mungo. They are also signalled to the south of the river Sanaga and in zones downstream from rivers Nyong and Ntem Selon Powell (1996). Threats: Poaching and loss of habitat constitute the main threats to the species in Cameroon. The meat and products of the manatee are even commercialised across the borders of Nigeria and of Chad (Powell, 1996). The destruction of mangroves and pollutions also constitute serious threats to the species according to different sources. Conservation Initiatives: In Cameroon the Law 94/01 of January 20th, 1994, concerning forestry, hunting and fishing and its application decrees protect the manatee. Cameroon is also signatory of the international treaties which protect the manatee. WWF-USA and the Wildlife Conservation Society initiated a study on manatees aiming to try reversing the trends of an unregulated and uxcessive hunt.

Equatorial Guinea

Habitats: recognized manatee habitats in Equatorial Guinea include the estuaries of Muni and Cogo. Individuals have been observed in the estuaries of Rio Woro and of Rio Ecucu. Threats: The manatees in Equatorial Guinea are threatened by ritual hunt and fishing activities. The destruction of mangrove swamps for the exploitation of firewood and the construction of houses, especially in the Muni estuary, constitute serious threats for the species. Conservation Initiatives: The governmental decree number 60/2002 of May 8th, 2002, which provides for the creation of INDEFOR (Instituto Nacional

de Desarrollo Forestal y Manejo del Sistema de Areas Protegidas) is relevant to the protection of manatees. Thanks to this decree, protected areas were created, in which manatee habitats are found.
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Gabon

Habitats: Gabon could have one of the highest densities of manatees remaining in Africa (Powell, 1996). The habitats of the species identified by Powell (1996) are the rivers Gabon and Ogoué and the Mondah bay. The coastal lagoons of Nkomi, N' Dogo and Sounga and the reserves of Setté Cama, Gamba and Petit Loango constitute the most important sites for the species. Threats: The intensive unregulated hunt according to Agondogo (2006). Various methods are used for the capture of the species. Conservation Initiatives: There is no national legislation protecting the species. Nevertheless, Gabon is signatory of the international treaties which protect the manatee. International NGOs support local initiatives.

Congo

Habitats: Recognized manatee habitats in Congo are: the Conkouati lagoon which hosts the biggest manatee population, the lake Nanga and the river Loémé in the south of Pointe-Noire. Threats: The capture of manatees is very high in the lakes Nanga and Loémé. At Conkouati, human pressure is a factor of disturbance to its habitat and its way of life, because of intensive fishing activities in the lagoon. Conservation Initiatives: The hunt of the manatee is strictly forbidden in accordance with the law 48 of April 21st, 1983 and its implementing decree, which regulate the conservation and exploitation of wild fauna. Congo is signatory of the international treaties which are dedicated to the protection of the species. In the field, eco guards work for manatee conservation in the Conkouati park.

Democratic Republic of Congo (DRC)

Habitats: Derscheid (1926) reports the presence of the manatee in the river Boma. Manatees have also been reported to occur in the Congo basin, notably at Mbomu, Uele and Kibali. Nishiwaki *et al.* (1982) indicate the presence of manatees in the Stanley Pool near Kinshasa. Threats: They essentially concern hunting. The destruction of mangroves and the pollution constitute serious threats to the species in DRC. Conservation Initiatives: No initiative in the field was launched for the conservation of the species. Also, there is no local law that protects the West African manatee. The DRC is signatory of the international treaties that protect the manatee.

Angola

Habitats: Hatt (1934) indicates that the rivers Loge, Dande, Bengo and Cuanza as manatee habitats in Angola. The species is recorded also in the national park of Kassima (rivers Cuanza and Longa). Threats: Morais (2006) points out that the manatee populations in Angola are diminuating. 77 individuals have been killed in the river Bengo in the course of 1998 and high catch rates have been noticed in the river Cuanza. Habitat destruction, especially as a consequence of mangrove exploitation along the river Cuanza, is an additional threat. Conservation Initiatives: Protected areas exist in Angola, notably the Quiçama National Park, crossed by the river Cuanza. Angola is a party to few international conventions which protect the manatee. The only notable convention is CBD signed on December 6th, 1994. No initiative in the field was undertaken for the conservation of the species.

Mali

Habitats: Manatees are present in the entire Niger river system in Mali (Powell, 1996). They are also present in the rivers Senegal and Bani and their tributairies. Kone and Diallo (2002) provide details on refuge habitats for the species in the localities of Kayo, Soubou, Koulikoro, Dinan, Marka, Kenenkou, Koumani, Segala and Nyamina in the community of Koulikoro. Threats: The manatee populations are declining in the whole distribution area in Mali. Hunting is carried out along the main rivers which are considered as habitats in the countries. Hunting activities are more important in the region of

Koulikoro. Irrigation activities for the agriculture and the construction of dams on the rivers, can also create major problems to the survival of the species. Conservation Initiatives: In Mali, the law n° 95-031 of 17 Febuary 1995, sets the conditions for the management of wild fauna. The manatee in included on Annex I, covering fully protected species. Mali also signed the international treaties which protect the manatee. No local activities in the field are signalled in favour of the conservation of the species.

Niger

Habitats: The manatee has been observed in the river Niger, downstream of Niger, in Nigeria, and upstream of Niger, in Mali. The species was assumed to have disappeared from Niger (Poche, 1973). The recent work of Ciofolo and Saidou (1996) determined the distribution of the species in three main sites of the country: the region of Ayorou BAC Farié, the zones of Goungou Makoni Haoussa Tafa Tondi Darou Bossia in Park W (75 km) and the sector Boumba – Gaya. Threats: They essentially concern hunt despite the fact that the species is given a high traditional value in all communities bordering its habitat. Conservation Initiatives: The law n 98-07 of 29 April 1998 which defines the hunting regime and the protection of fauna in Niger lists the manatee in Annex I, that is to say a completely protected species. The species benefits from a particular protection, considering that most of its habitat is located in the W park. Niger is signatory of the main treaties which protect the West African manatee.

Chad

Habitats: The manatee populations are reported in the lakes Léré and Tréné, situated in the south east of Chad. The sites frequented by the species are the villages situated around the lakes: Fouli, Mourbamé, Dissing, Labzayé, Tezoko, Doué and the fishing restriction zones of lake Léré. Threats: The main threat to the species of Chad is poaching undertaken by the ethnic group Haoussa originating from Nigeria, which lives in the villages Fouli and Dissing. Conservation initiatives: the species is fully protected by ordinance 14/63 of march 1963. Chad is also signatory of the main international conventions which protect the manatee. In the field, local initiatives have been undertaken aiming at the protection of species with the financial support of the project for the management and conservation of natural resources / GTZ.

Burkina Faso

The manatees are found in all the countries that surround Burkina Faso (Mali, Côte d'Ivoire, Ghana, Togo, Benin and Niger). They are also found in the lake Volta upstream of the dam (see Ghana mentioned above). However, no record could be found of its presence neither in the upper affluents of the river Volta (Volta Blanche, Volta Rouge and Volta Noire), nor in the river Mekrou, which forms a border between Burkina Faso, Togo and Benin and drains the wetlands of the Arly National Park. While waiting for surveys, which could confirm it, the presence of the species in these areas must be regarded as possible.

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

A. PROPOSAL: Inclusion of the Barbary sheep *Ammotragus lervia* on Appendix I

B. PROPONENT: Government of Algeria

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Artiodactyla
1.3	**Familia**	Bovidae
1.4	**Genus and species**	*Ammotragus lervia* (Pallas, 1777)
1.5	**Common name(s)**	English - Barbary sheep, UADDAN, Aoudad French - Mouflon à manchettes

1.6 Taxonomy and evolution

The morphology and physiology of the Barbary sheep do not allow a clear classification in the zoological system. While the species can be classed easily as part of the family *Bovidae* and the subfamily *Caprinae* (goats and sheep), its sub-classification is less obvious. In fact, some of its characteristics suggest kinship to sheep (genus *Ovis*), others kinship to goats (genus *Capra*), which does not provide for a solid basis for sub-classification in the system.

The paleontological discoveries relating to this species are few and confirm the occurrence of Barbary sheep in North Africa during the Pleistocene and alluvial periods. Based on a number of criteria, it can be assumed that the Barbary sheep branched off from the common ancestor of sheep and goats before the two separated.

The skull of the Barbary sheep bears testimony to the species' kinship with the *Caprinae* taxon. The frontals and the parietal cavity are characteristic signs. Incisors are typically goat-like, while molars are sheep-like. Although the horns of the Barbary sheep resemble the horns of sheep, their diameter and shape remind of goat's horns.

Sub-species described:

Ammotragus lervia lervia
Ammotragus lervia angusi
Ammotragus lervia blainei
Ammotragus lervia fassini
Ammotragus lervia sahariensis

Ammotragus lervia ornatus: According to IUCN data (2007), this subspecies was listed as Extinct in 1996, and relisted later as Extinct in the Wild (on the grounds that the taxon still existed as part of a captive breeding programme). The conservation status of this taxon is currently under further review, following recent reports documenting the continued existence in the wild in Egypt (Saleh 1991, 1993, 2000).

2. Biological data

The Barbary sheep (*Ammotragus lervia*) or aoudad is native to the Sahara and its sub-Saharan fringes. It can still be found in most suitable habitats in the region, from the Atlantic coast to the Red Sea, and from the Mediterranean Atlas Mountains to the steep slopes of the northern Sahel. Impressive in size (males weigh up to 145 kilos), the Barbary sheep is an extremely resilient and incredibly nimble animal, and manages to survive in some of Africa's most arid regions receiving little or no rainfall for several years at a time. This does not mean that Barbary sheep do not drink, but rather that they are able to satisfy their water requirements through the plants they eat. When water is available, after rainfall or from springs or mountain pools (gueltas), they do drink, which makes them extremely vulnerable to hunters, especially during the hot season. Traditional hunters set traps and build blinds from which they shoot passing animals. Despite their adaptability, Barbary sheep are severely affected when vegetation disappears and entire populations may become extinct suddenly. When conditions are good, however, the sheep breed well and react rapidly to favourable circumstances by giving birth to twins or even triplets.

A skilful climber, used to moving on steep rocky surfaces, the sheep can find food and water in areas that other grazers cannot reach, such as deep canyons and high rocky plateaus. In the Moroccan High Atlas, they can be found as high as 3,000 m in areas with lots of snow. In the Red Sea Mountains of Egypt, they share their habitat with another local species, the Nubian Ibex (*Capra ibex*). Typically, Barbary sheep will shelter from the midday heat and from wind under boulders, in caves or on sheltered plateaus. They love to dust themselves in specially excavated holes. If disturbed, they flee quickly for rocky slopes where they are safe. When they leave the mountains to come into *wadis* to feed or cross between rocky outcrops, they are extremely vulnerable.

The male sheep have very big and heavy horns they use to ram acacia trees and shake them so that the nutritious pods fall down. Barbary sheep live in extended families; there are also bachelor herds. They can cover large distances and colonize suitable areas rapidly. This is the case in southern Tunisia, where the protected populations in the Bou Hedma and Dghoumes National Parks were able to recolonize mountain ranges from which they had been eliminated some 50 years ago.

In large protected areas, such as the Hoggar and Tassili National Parks in southern Algeria, Barbary sheep populations are healthy and may number several thousand heads. But despite their resilience and rock-loving habits, Barbary sheep are very vulnerable and many small, fragmented populations have either been wiped out by hunting or are in a critical state. The spread of automatic weapons throughout the Sahara, coupled with insecurity in many mountainous areas, has resulted in serious declines in many places. Although the Barbary sheep is listed as a globally vulnerable species on the IUCN Red List, this does not reflect the local situation, where its conservation status is often quite dramatic.

The pelage of the Barbary sheep is tawny brown, with stiff and bristly hairs and a soft, curly undercoat. Very long tawny brown hairs cascade down from the neck, throat and withers in the shape of a heavy fringe, which in the lower part extends to the front portion of the front legs in the shape of a mane that starts near the jaw. The mane divides at the brisket and continues down the clavicle and front legs. Even the underbelly is covered in curls. The top of hoof is covered in a crown of longish, chestnut-coloured hairs.

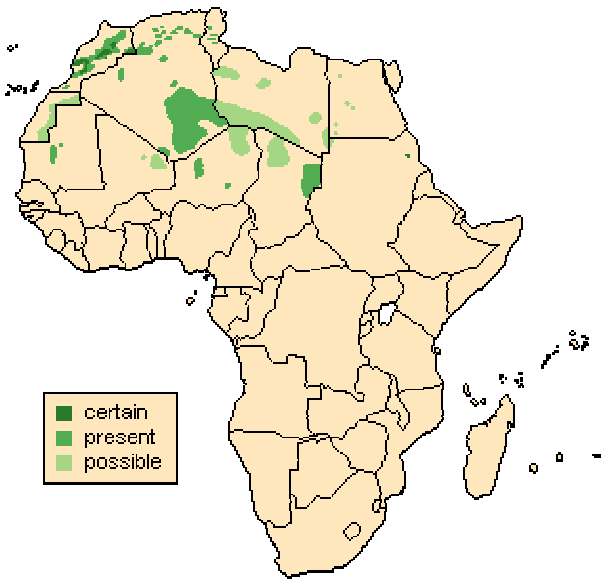
The basic social unit of the Barbary sheep consists of a male, one or two females and their offspring. Larger groups may be formed between different sexes or several males. If various nubile males live in a herd, a stable linear hierarchy is established between them.

2.1 Distribution (current and historical)

Barbary sheep are native to the arid and semi-arid mountains of the North African Atlas and the rocky areas of the Sahara stretching from the Atlantic ocean to the Red Sea (southern Mauritania, Algeria, Chad, Niger, the Aïr and Ennedi mountain ranges and northern Sudan). Data for the Middle East are less precise. High population densities are restricted to the regions of Darfur, north-eastern Sudan, Ennedi, Tibesti, Aïr, Hoggar, the Tassili-Nadjer range, Adrar, central Mauritania and Morocco.

Barbary sheep were introduced into Europe and North America (New Mexico, Texas, California). Some introduction efforts in Europe such as, for example, in Italy were not crowned with success. In the Czech Republic, there is a small population descendant from animals that escaped from the Plzeň zoo.

In Morocco, the species is still found in the wild in the Anti Atlas region; the Bani, Zini, Aydar and Adrar Souttouf ranges; and in the mountains in general. Traditionally, the species' range extended across arid to semi-arid slopes and foothills of the High Atlas, Anti Atlas and Bani massifs. It is highly uncertain whether the species still exists in the mountains of southern Sahara, which are currently hardly accessible (Cuzin, 2003).



Range map Barbary sheep (redrawn from Shackleton, 1997).

2.2 Population

The species is listed as globally vulnerable (VU A2cd), and occurs in the wild in North Africa and the Sahara regions only.

Across its geographic range, except in Morocco, little is known about population sizes and trends.

In Morocco, the species is considered "endangered" (Cuzin, 1996). The population is estimated at 800 to 2000 individuals (Cuzin, 2003). Most of these animals live within protected areas. Outside the reserves small, highly threatened populations survive. The species is near-extinct in the Middle Atlas (small populations are probably still existent in the Outat Oulad El Haj region) and in decline in the Anti Atlas and the Saharan Atlas; the highest densities are found in the High Atlas.

2.3 Habitat

Barbary sheep mainly occur in arid, mountainous terrain, and in those environments mostly at high altitudes, and in the xerophyte and chamaephyte steppes. The species also frequents the rocky hills of the Saharan steppe.

They strictly avoid dense forests and low Saharan plateaus. They are never found in sandy environments, irrespective of the amount of accumulated sand. Given that Barbary sheep were hunted extensively, which often drove them into the highest mountains, current habitat preferences are mainly resulting from human hunting practices.

2.4 Cross-boundary migration and movement

While there are no migratory movements in the biological sense of the term, Barbary sheep populations are found - or used to be found – in certain mountains ranges straddling international borders.

3 Threats

IUCN status (2007): the species is listed as globally vulnerable (VU A2cd).

3.1 Direct and potential threats

It is undeniable that grazing areas, especially in the mountains, have been reduced in recent decades (Gauquelin 1988, Ou Tahar 1994, Quézel *& al* 1994, Maselli 1995, Ouhammou *& al.* 1996). However, given the extensive range of *Ammotragus lervi*a, its excellent adaptability and extremely flexible feeding habits (Cassinello 1998), and the fact that it was introduced successfully into the United States and Spain, it appears that anthropogenic environmental destruction is only a minor factor in the decline of the species (Cuzin, 2003).

The most significant factor in the species' decline appears to be overharvesting, notably abusive hunting, which is strictly regulated since the 1950s and illegal as of 1968 (Aulagnier & Thévenot 1986). To mountain dwellers, the Barbary sheep is the game par excellence and its meat is highly prized as a tonic (Roux 1955).

The species is further threatened by disturbance and predation from dogs (Loggers *& al.* 1992).

3.2 Habitat destruction

3.3 Indirect threat

Increasing population fragmentation and the desertification of their habitat threaten the long-term survival of the species.

3.4 Threats connected especially with migration

3.5 National and international utilization

It is a huntable species and is hunted across most of its range.

4 Protection status and needs

4.1 National protection status

Not known.

4.2 International protection status

Listed in Annex II of CITES.

4.3 Additional protection needs

- Need for information on the current numbers and trends in isolated Barbary sheep populations.

- Implementation of relevant legislation throughout range states.

5 Range States[1]

ALGERIA, LIBYA, MALI, MOROCCO, NIGER, Sudan, CHAD, TUNISIA.

6. Comments from Range States

7. Additional remarks

[1] CMS Parties in capitals.

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

A. PROPOSAL: To add the whole population of *Aythya baeri* to Appendix I

B. PROPONENT: Government of Mongolia

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Aves
1.2	**Ordo**	Anseriformes
1.3	**Familia**	Anatidae
1.4	**Species**	*Aythya baeri*
1.5	**Common name(s)**	Baer's Pochard, Fuligule de Baer, Porrón de Baer

2. Biological data

2.1 Distribution

This species, the whole population of which is migratory, breeds in the Amur and Ussuri basins in Russia and north-eastern China. It winters mainly in eastern and southern mainland China (c. 850 individuals), India, Bangladesh (1,000 - 2,000 individuals) and Myanmar (1,000 - 1,500 individuals) with smaller numbers in Japan, North Korea, South Korea (very few records in the latter three countries in recent years), Taiwan and Hong Kong (China), Nepal (now a very rare visitor and absent in some years), Bhutan, Thailand (still regular in small numbers, Lao PDR (only one confirmed record), and Vietnam (very rare in recent years) and is a rare migrant to Mongolia. It has declined rapidly in recent years, for instance at Bung Boraphet, Thailand, up to 426 were recorded in 1988 whilst now there are more usually four or five individuals. It is now absent or occurs in greatly reduced numbers over much of its former wintering grounds and is common nowhere.

2.2 Population

The total population is now likely to be less than 5,000 individuals. Owing to an apparent acceleration in the rate of its decline (as measured by numbers on the wintering grounds), the species has been uplisted to Endangered by IUCN.

2.3 Habitat

The typical breeding habitat is around lakes, in rich aquatic vegetation, such as dense grass or flooded tussock/shrubby meadows. It also breeds in coastal wetlands with dense vegetation, or on rivers and ponds surrounded by forest. The nest is built on a tussock or under shrubs, sometimes floating, and occasionally amongst branches. In winter, it occurs mainly on freshwater lakes and reservoirs.

2.4 Migrations

The species migrates after moulting on its breeding grounds. Full information is not available on the routes taken, but the species is congregatory, and it may be that there are no sites holding significant numbers of individuals that remain to be identified, either along the migration flyway, or on the wintering grounds.

3. Threat data

3.1 Direct threat

These require more research. However, the species is rather similar in appearance to other, commoner, species of waterfowl, particularly in the genus *Aythya*, and these are widely and commonly taken for food all along the flyway of the species. This similarity poses particular challenges for national and local authorities, and for the hunting community, in conserving this endangered bird.

3.2 Habitat destruction

It is thought that wetland degradation and destruction (including for rice-production) is likely to be a key threat. More investigation is needed.

3.3 Indirect threat

None known.

3.4 Threat connected especially with migrations

None known.

3.5 National and international utilisation

Wild ducks, including in the genus *Aythya*, are commonly taken for food in most or all of the Range States of this species. It is certain to be regularly taken with them.

4. Protection status and needs

4.1 National protection status

It is legally protected in Russia, Mongolia and Hong Kong (China) and in some provinces in China. Some of its breeding and wintering sites are within protected areas, including Daursky, Lake Khanka and Lake Bolon' (Russia), Sanjiang and Xianghai (China), Mai Po (Hong Kong), Koshi Barrage (Nepal), and Thale Noi (Thailand).

4.2 International protection status

The species is listed on CMS Appendix II.

4.3 Additional protection needs

The species is in need of full legal protection throughout its range. Efforts are needed, particularly among hunters and by hunting authorities, to ensure that the bird is not killed whilst among look-alike species. All of its regular wintering sites need to be given formal protection.

5. Range States[1]

BANGLADESH, Bhutan, China, INDIA, Japan, Lao PDR, MONGOLIA, Myanmar, Nepal, North Korea, Russian Federation, South Korea, Thailand, Viet Nam.

6. Comments from Range States

7. Additional remarks

8. References

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BirdLife International (2008) Species factsheet: *Aythya baeri*. Downloaded from http://www.birdlife.org on 22/6/2008.

[1] CMS Parties in capitals

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

A. PROPOSAL: Inclusion of *Neophron percnopterus* on Appendix I

B. PROPONENT: European Community and its Member States

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Aves
1.2	**Ordo**	Falconiformes
1.3	**Familia**	Accipitridae
1.4	**Genus or Species**	*Neophron percnopterus*
1.5	**Common name(s)**	English: Egyptian Vulture French: Vautour percnoptère Spanish: Alimoche común, Guirre

2. Biological data

2.1 Distribution

Migratory birds of this species breed in southern Europe from Spain to the Caucasus, central Asia, Pakistan, northern India and Nepal. They winter in areas where they overlap with resident populations. The bulk of the resident population occurs in Ethiopia, East Africa and the Indian Subcontinent, with isolated populations found in the western Atlantic islands, northern and eastern Africa, and Namibia and Angola.

In Spain, its range occupies the Pyrenees, Cantabrian Mountains, Ebro River basin, Iberian System, Andalusian and sub-Andalusian mountain ranges, Sierra Morena mountain range, Tajo river basin, Arribes de Duero, and the Balearic and Canary Islands (Fuerteventura and Lanzarote). The range is determined by the availability of food, which essentially consists of livestock carrions and human waste.

2.2 Population

The global population is estimated at 20,000 to 49,999 birds and is in decline (2,600-3,100 pairs in Europe, < 2,000 pairs in central Asia, just a few thousand pairs on the Indian Subcontinent, perhaps 1,000 pairs in the Middle East and perhaps < 7,500 couples in Africa, which gives a total of 30,000-40,000 mature individuals).

An extremely rapid population decline has occurred in India, presumably resulting from intoxication with the anti-inflammatory veterinary drug Diclofenac, to whose effects the vultures are extremely susceptible; numbers detected on road transects declined by 68 % (between 2000 and 2003) and the decline is estimated at > 35% per year since 1999; this is

combined with severe long term declines in Europe (> 50% over the last three generations (42 years)) and West Africa. Resident populations within the continent have also declined, including in Ethiopia, Djibouti, Angola and Namibia (where just 10 pairs remain). Across much of Africa, resident populations are outnumbered by migrant European breeders. Similar declines are reported from the Middle East (50-75% in the last three generations); although in Oman the population is apparently stable and 1,000 birds are resident in a stable population on the island of Socotra).

The European population has declined by over 50% in the last three generations, with a clear downward trend in the population in Spain (the largest in the Western Palaearctic and, with some 1,300 pairs, perhaps one of the largest in the world) over the last 20 years (between 1987 and 2000 the range has declined by at least 25%). It is extinct from many provinces in Spain (Almería, Huelva, Murcia, Albacete, Madrid, Ávila and Orense), and in some areas (Ebro River Valley) up to 70 % have disappeared. The breeding population in Aragón has been reduced by half and declines by some 30 per cent have been recorded in Burgos, the Andalusian mountain ranges, and the Canary Islands. The species is listed as globally endangered on the IUCN Red List.

2.3 Habitat

Lives in extensive open areas mainly in dry or arid regions, although they are sometimes found on the edge of humid and cold climatic zones; steppes, deserts, scrubland, grassland and cereal fields, and near human settlements. Typically nests on rocky outcrops, although occasionally may also nest in large trees.

The Spanish population is not very selective in its rock-nesting habits; in order to colonize, the birds need extensive, sparsely populated open land, essential to foraging. They shy away from expansive, dense forests and dense scrublands. Otherwise, the species is very ubiquitous. Its occurrence appears to be related to the presence of livestock, although densities stand in no correlation to the abundance of livestock, but rather to the availability of cliffs for nesting.

Communal roosts are formed in woodlands, depending almost exclusively on garbage dumps and livestock carcasses sites supplied by farms and slaughterhouses.

2.4 Migrations

Northern breeders migrate mainly in the period March to September. The migratory specimen travel to Africa across the Strait of Gibraltar, the Suez Canal and the Strait of Bab al Mandab.

3. Threat data

3.1 Direct threat

- The vultures are severely affected by poisoning, which has driven its disappearance from many areas of Spain; after years of relative calm in the early 1990s, the use of the poison for predator control in game reserves has increased drastically and many birds have been found dead (i.e. at least 67 birds in the period 1995-98).
- Direct persecution, shooting, destruction and plundering of nests. They are shot dead because they are considered predators or used as trophies.

- Lack of food resources; health regulations stipulating that dead livestock must be buried and the closure of traditional livestock carcasses sites have led to a significant reduction in the amount of food available.
- Collision with built structures such as wind turbines and electrocution on power lines.

3.2 Habitat destruction

- Changing environment in feeding grounds.
- Changes in breeding ground conditions and disturbance during breeding.
- Discontinuation of agrosilvopastoral farming and related activities that ensure the availability of potential prey.
- Habitat loss in some areas due to overgrazing by livestock.

3.3 Indirect threat

- Alteration of the reproductive system owing to accumulation of toxins (agricultural biocides).
- The effect of Diclofenac on migratory birds on the Indian Subcontinent and in Africa, where the product was found to be on sale in Tanzania and used in many other African countries. On the other hand, antibiotic residue in intensively farmed livestock carrion has led to an increase in fatalities in vulture chicks.
- Diminishing food resources resulting from the downward trend in extensive livestock farming, and the negative effect of the reduced number of carcass disposal sites. The adoption of a European Union regulation on livestock carcass disposal in 2002, for example, has reduced the availability of food resources (largely owing to the closure of traditional carcass disposal sites in Spain and Portugal).
- Population decline has also been driven by loss of wild ungulate populations, and thus their carrion, in rural areas, as well as the loss of small mammals on which the vultures feed directly.
- Pesticide intoxication may also have had an impact in part of its range, and so has lead poisoning from animals shot with hunting rifles.

3.4 Threats connected especially with migrations

- The lack of food resources and collision with power lines or the effect of wind turbines on their migration routes.
- Changes in the wintering sites and migration flyway.

3.5 National and international utilization

- In Morocco, at least, the species is taken for use in traditional medicine.

4. Protection status and needs

4.1 National protection status

Listed in the National Catalogue of Endangered Species (Order MAM/1498/2006)
Category: Vulnerable (populations in Spain and the Balearic Islands)
In Danger of Extinction (populations on the Canary Islands)

Listed in the following regional catalogues of endangered species:
- Regional Catalogue of Andalusia: Category: In Danger of Extinction (Act 8/2003)
- Regional Catalogue of. Aragon: Category: Vulnerable (Decree 49/1995)
- Regional Catalogue of Asturias: Category: Of Special Interest (Decree 32/90)
- Regional Catalogue of Canaries: Category: In Danger of Extinction (Decree 151/2001)
- Regional Catalogue of Castile-La Mancha: Category: Vulnerable (Decree 33/98)
- Regional Catalogue of Extremadura: Category: Vulnerable (Decree 37/2001)
- Regional Catalogue of Madrid: Category: In Danger of Extinction (Decree 18/92)
- Regional Catalogue of. Murcia: Category: Extinct (Act 7/95)
- Regional Catalogue of. Navarre: Category: Vulnerable (Provincial Decree 563/1995)
- Regional Catalogue of Basque Country: Category: Vulnerable (Decree 167/1996)
- Regional Catalogue of City of Valencia: Category: Vulnerable (Order of 1 December 2006)

Listed in conservation category B by Law 12/2006 of Catalonia

4.2 International protection status

Listed in Annex I of the directive 79/409/EEC on the conservation of wild birds; in Appendix II of the Bern Convention; in Regulation (EC) 338/97, CITES Annex A (II) and Appendix II of the CMS.

Outside Europe, many countries have legislation to protect the species, but others do not. Its range often coincides with protected areas, but whose protection measures are not specific to the species.

Monitoring and supplementary feeding programmes and campaigns against the illegal use of poison are in place for a number of national populations. The Indian Government has now banned Diclofenac.

4.3 Additional protection needs

All range states should ratify the Bonn Convention:
- Protect nesting sites where pillaging is a problem.
- Explore the possibility of relaxing implementation of the European Union regulation on carcass disposal to increase the amount of food available to the vultures, while protecting human and animal health at all times.
- Establish supplementary feeding sites where appropriate.
- Raise awareness of the dangers of using Diclofenac for livestock in Africa.
- Effective reduction of exposure to poison through enforcement of the prohibition of poisoned bait use, and through education.
- Lobby for the banning of Diclofenac for veterinary purposes throughout the species' range, and support enforcement of this ban where it has been adopted.
- Where applicable, establish the impact of wind turbines, and lobby for effective impact assessment to be carried out prior to their construction.
- Where appropriate, avoid disturbance by keepers.

5. Ranges states[1]

Afghanistan, ALGERIA, ANGOLA, Azerbaijan, BULGARIA, CHAD, EGYPT, United Arab Emirates, ERITREA, SPAIN, Ethiopia, FRANCE, GAMBIA, GEORGIA, GREECE, GUINEA, INDIA, IRAN, ISRAEL, KAZAKHSTAN, KENYA, Kyrgyzstan, Lebanon, LIBYA, MALI, MAURITANIA, MOROCCO, Namibia, Nepal, NIGER, Oman, PAKISTAN, PORTUGAL, Russian Federation, SAUDI ARABIA, SENEGAL, SOUTH AFRICA, SOMALIA, SYRIA, Sudan, TAJIKISTAN, TANZANIA, FORMER YUGOSLAV REPUBLIC OF MACEDONIA, TUNISIA, Turkey, Turkmenistan, UGANDA, UKRAINE, UZBEKISTAN, YEMEN.

6. Comments from Range States

7. Additional remarks

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[1] CMS Parties in Capitals.

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

A. PROPOSAL: To list the entire population of *Falco cherrug* on Appendix I

B. PROPONENT: Government of Croatia

C. SUPPORTING STATEMENT:

1. Taxon

1.1 Classis: Aves
1.2 Ordo: Falconiformes
1.3 Familia: Falconidae
1.4 Species: *Falco cherrug*
1.5 Common name(s): Saker Falcon; Saker; Faucon sacré; Halcón sacre

2. Biological data

2.1 Distribution

Overall, this species is strongly migratory. A few populations tend to be sedentary, but this depends upon the extent to which food supply in the breeding area is sustained throughout the year. It has a wide range from central and eastern Europe to Mongolia and western China, extending south in Asia as far as India, and in Africa as far as Kenya. In general, the more northerly states make up its breeding range and the southerly ones its wintering range, but there is some latitudinal overlap of the two ranges in eastern Europe, Central Asia, the Middle East and China.

2.2 Population

The global population was estimated to be 8,500-12,000 pairs in 1990, and 3,600-4,400 pairs (7,200 to 8,800 individuals) in 2003. This puts the population decline at 48-70% over this period, with a best estimate (between median estimates for 1990 and 2003) of 61%. This very rapid population decline is particularly marked on the Central Asian breeding grounds. Assuming a generation length of five years and that the decline of the Saker began (at least in some areas) in the 1970s and 1980s, the declines over 13 years equate to 66% over 15 years (based on median estimates), with a minimum-maximum of 53-75%. Declines for the following countries give particular cause for concern: Kazakhstan (90% decline from median of 1990 estimates to median of 2003 estimates), Uzbekistan (90% decline), Russian Federation (69%), Kyrgyzstan (68%) and Mongolia (59%). European population underwent a large decline (> 20% in two generations) between 1990 and 2000 (Nagy & Demeter 2006). The species is classified by IUCN as Endangered.

2.3 Habitat

It prefers open grassy landscapes such as desert edge, semi-desert, steppes, agricultural areas, arid montane areas; in some regions, particularly near water. It uses copses of trees or cliffs for nest sites and occasionally the ground, occupying the old nests of other birds. Man-made structures (including electricity pylons) are also sometimes used, and in some countries, this is deliberately encouraged for conservation purposes by setting artificial nests.

2.4 Migrations

The species completely leaves its more northerly nesting areas at the end of every breeding season. Elsewhere, individuals may all leave, or some may remain, at least partly depending on the severity of the winter and the availability of prey. Migration is noted annually through the Mediterranean region, Turkey and the Middle East, Central Asia, India and China. Birds depart the northern breeding areas in late September and October, returning in March and early April. In its more southerly breeding areas, it may leave for much shorter periods; for instance, it may leave Romania in November and return in February to March. In Slovakia, it may still be present for all but a period in January to February. In Africa, the bird arrives in October and stays until March or, at latest, April.

3. Threat data

3.1 Direct threat

Deliberate killing by humans is known to occur, though the extent to which this is a problem for the conservation of the species is hard to determine. Death and reduced breeding success caused by pesticides, to which large falcons are well know to be sensitive, is likely still to be a factor in some parts of the bird's range. A key issue is the taking of birds for falconry. Recent declines, and even local extinctions, have been attributed as being specifically due to this activity. Studies have estimated that the numbers of Saker Falcons trapped annually for Middle East falconers are 4,000 in Saudi Arabia, 1,000 in Qatar and 500-1,000 in each of Bahrain, Kuwait and UAE, which, allowing for a 5% mortality prior to receipt, indicates an annual consumption of 6,825-8,400 birds. Of these, the great majority (77%) are believed to be juvenile females, followed by 19% adult females, 3% juvenile males and 1% adult males, potentially creating a major bias in the wild population. (Females are larger and more powerful in this species as in many of the falcons, and are thus disproportionately selected for falconry.) (Erwda 2003, Fox 2002). Taking in numbers that even approach these kinds of figures cannot be sustainable in this species.

Electrocution was reported as a threat from Hungary and China. With the recent adaptation for breeding on electricity pylons in the west of the range, it may become a serious threat.

3.2 Habitat destruction

In its European range, the species has suffered mainly from the loss and degradation of steppes and dry grasslands through agricultural intensification, plantation establishment and declines in sheep-grazing. All of these factors contribute to a decline in key prey species, particularly small mammals, such as susliks and hamsters. Due to habitat changes in the western part of the range, birds have become a more important component of the diet.

Landscape reversion following the abandonment of agriculture may also have a negative influence, as most prey species require short swards that are maintained by agricultural practices.

3.3 Indirect threats

Hybridisation with escaped or released hybrid falcons (which is known to occur) could influence the genetic integrity of wild populations.

3.4 Threats connected especially with migrations

Electrocution and collision with wires are reported as a threat from China (for birds of the wintering Mongolian population) and Bulgaria.

3.5 National and international utilisation

Apart from taking for falconry, none is known.

4. Protection status and needs

4.1 National protection status

The Saker is a protected and often red-listed species in many range states, particularly in the western parts of its range.

4.2 International protection status

I
t is listed on CITES Appendix II. Controls of illegal trade were implemented in various countries in the bird's western range in the1990s. It is listed on the Appendix 1 of proposed draft Action Plan of Raptor MoU.

4.3 Additional protection needs

The species should receive protection under national legislation in countries where this is not already the case. Greater protection (against habitat conversion, degradation and pollution) of key breeding environments is also important. Solutions must be found to the issue of unsustainable taking for falconry. As one example, captive breeding has developed strongly in some countries, including UAE, as a means of substitution for wild-caught birds. Intensive wardening and management has produced a steadily rising population in Hungary, and such techniques could be used in other breeding Range States (Baumgart 1994). The maintenance of ecologically and socially sustainable grazing systems would help to ensure long-term survival of key prey species. Other needs include: improved systems of customs control and the enforcement of CITES regulations; and improved microchipping schemes to help monitor and regulate trade and quantify its effects.

5. Range States[1]

Afghanistan, Armenia, AUSTRIA, Azerbaijan, Bahrain, BELARUS, BULGARIA, China, CROATIA, CYPRUS, CZECH REPUBLIC, EGYPT, Ethiopia, HUNGARY, INDIA, IRAN, Iraq, ISRAEL, ITALY, JORDAN, KAZAKHSTAN, KENYA, Kuwait, Kyrgyzstan, LIBYA, MALTA, MOLDOVA, MONGOLIA, Nepal, Oman, PAKISTAN, ROMANIA, Russian Federation, SAUDI ARABIA, SERBIA, SLOVAKIA, Sudan, TAJIKISTAN, TUNISIA Turkey, Turkmenistan, UKRAINE, United Arab Emirates, UZBEKISTAN, YEMEN. (Small numbers or single vagrants reach many other countries).

6. Comments from Range States

7. Additional remarks

8. References

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[1] CMS Parties in capitals.

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

A. PROPOSAL: Inclusion of Peruvian Tern, *Sterna lorata*, Philippi and Lanbeck 1861 on Appendix I of CMS

B. PROPONENT: Government of Peru

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Birds
1.2	**Ordo**	Charadriiformes
1.3	**Familia**	Laridae
1.4	**Species**	*Sterna lorata*, Philippi and Landbeck, 1861
1.5	**Common name(s)**	English: Peruvian Tern Spanish: Gaviotín chico

2. Biological data

2.1 Distribution

Species restricted to the Humboldt Current zone along the south-eastern coasts of the East Pacific: Ecuador, Peru and Chile. Its actual range extends from the Manglares de Vice in northern Peru to the Mejillones Peninsula in northern Chile. Its movements and wanderings are poorly known, but the species has been recorded as far as northern Ecuador. There are currently three known breeding sites in Peru and nine in Chile (the latter are all located on the Mejillones Peninsula). Current numbers are estimated at 150 to 160 pairs in this distribution range, with breeding apparently taking place only in some parts of this extensive coastline that covers approximately 200,000 km2.

2.2 Population

Recent population estimates record between 1,000 and 2,500 birds, with numbers in decline. Some reports suggest that the population may have declined by 50 % in the last 10 years. Currently, there are three known breeding sites in Peru and nine in Chile (the latter are all located on the Mejillones Peninsula). The breeding population is currently estimated at no

more than 150 to 160 pairs. Current numbers at all sites are estimated at 950-1,000 birds, against historical estimates of over 5,000 pairs (10,000 individuals).

2.3 Habitat

Coastal species that breeds and rests on sandy beaches and dunes up to 100-200 m from the high tide mark; tends to be associated with wetlands or desert plains some 1-3 km inland.

2.4 Migrations

There is no real information; the distribution range is known, without knowing whether the species is partially or completely migratory or wanders nomadically up and downs the coasts of the three countries. There are suggestions that the species may move north to Ecuador in winter. Flocks of up to 70 individuals have been sighted up to 200 km out to sea during El Niño years.

3. Threat data

3.1 Direct threats to the population

The principal direct threat to the species is disturbance in its breeding grounds. This is mainly caused by the presence of bathers on the beach in summer (egg-laying happens between August and February) and building of seaside resorts and summer homes, fishing coves or port and industry facilities along the coast (such is the case of Mejillones in Chile). Races of sand motorbikes and 4x4 vehicles also have a direct impact as they cut across beaches and dunes. Presumed predators are birds such as *Cacara plancus* and *Falco peregrinus*, and mammal such as foxes (*Pseudalopex spp.*) and stray dogs.

3.2 Habitat destruction

For the reasons mentioned in 3.1, the habitat is being - or has been - changed and degraded either temporarily or permanently. One notable consequence has been the loss of eggs through nest desertion or destruction.

3.3 Indirect threat

It has been suggested – without supporting data – that the species may suffer from the competition from commercial fishing since the overfishing of pelagic species during the 1970s in Chile and Peru, and from the pollution of estuaries (consequence of mining activities in most mining areas in northern Chile). The loud noise and intense activities of surrounding industrial zones, the noise of planes and helicopters, the noise of nearby detonations, vehicle traffic and the proximity of people are disruptive.

3.4 Threats connected especially with migration

Little is known about the movements or migration of this species. We know that the species disappears between April and July each year, when it is believed to spend more time out on sea, i.e. it moves out to sea. Birds that frequent polluted estuaries and coastal areas may

become intoxicated or contract diseases, especially on the mouths of rivers known to evacuate untreated or mining waste.

3.5 National and international utilization

None.

4. Protection status and needs

4.1 National protection status

In Chile, CONAMA (2006) has recognized the species as threatened with extinction. In Peru it is classified as "vulnerable" by Supreme Decree (INRENA, 2004).

4.2 International protection status

Coastal species of the gull family which, based on its current population status and trend, has been classified as ENDANGERED (EN C2a(i)) by IUCN; i.e. its population size is estimated to number fewer than 2,500 mature individuals and a continuing decline observed, projected or inferred.

4.3 Additional protection needs

National policies for coastal protected area management are required, especially in those coastal areas where the species and other birds breed and rest. Coastal management plans should stem urban growth and the building of port and warehousing facilities.

5. Range States[1]

CHILE, ECUADOR, PERU.

6. Comments from Range States

The three countries are Parties to the CMS and are in a position to carry out joint studies by way of concrete, concerted action in support of the conservation of the species.

7. Additional remarks

[1] CMS Parties in capitals.

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

A. PROPOSAL: Listing the entire population of *Emberiza aureola* on Appendix I

B. PROPONENT: Government of Mongolia

C. SUPPORTING STATEMENT:

1. Taxon

1.1 Classis: Aves
1.2 Ordo: Passeriformes
1.3 Familia: Emberizidae
1.4 Species: *Emberiza aureola*
1.5 Common name(s): Yellow-breasted Bunting, Bruant aureole, Escribano aureolado

2. Biological data

2.1 Distribution

The entire population of this species is migratory. It breeds in Finland, Russia, Belarus, Ukraine, Kazakhstan, China, Mongolia, and Japan. It winters in southern China, Nepal, India, Bangladesh, Myanmar, Thailand, Cambodia, Laos and Vietnam.

2.2 Population

A population estimate for the whole population does not seem to have been made. A 2004 estimate for Europe was 20,000 to 100,000 pairs. The same study reported that the stronghold population in Russia declined markedly during 1990-2000, and that the overall trend in Europe was considered to be one of moderate decline (more than 10%). It was formerly one of the most abundant breeding passerines across vast swathes of Siberia, but, although it remains common in some regions, and although there have been no systematic surveys, a severe decline has been noted in most breeding areas and it has completely disappeared from parts of its former breeding range over the last twenty years. No birds have bred in Finland in the last three years, and in Kazakhstan its range has contracted northwards by 300 km over the last 15 years. It has declined rapidly in Russia both in the Moscow and Baikal Regions, and severe declines have recently been noted in Hokkaido, Japan and Mongolia. The "swarms" formerly seen at well-studied migration watch-points such as Beidaihe, China, have not occurred recently. Numbers at sites throughout its wintering range have also shown rapid declines over the last twenty years. In 2008, IUCN uplisted the global conservation status of the species to Vulnerable.

2.3 Habitat

It breeds in wet meadows with tall vegetation and scattered scrub, riverside thickets and secondary scrub. It winters in large flocks in cultivated areas, rice fields and grasslands, preferring scrubby dry-water rice fields for foraging and reedbeds for roosting.

2.4 Migrations

In the autumn, birds stop over in large numbers to moult in the Yangtze Valley, China before continuing to their winter quarters. The bird is somewhat subject to vagrancy, with small numbers appearing annually in Western Europe in the autumn migration period.

3. Threat data

3.1 Direct threat

This bird is hunted when on migration, and especially at its wintering sites. Most notably, roosting flocks are caught in reedbeds, using mist-nets. The birds are then commonly cooked and sold, often as a snack-food. This practice was formerly restricted to South China, but has reportedly become more widespread owing to increased affluence in the region. Hunters, it is said, now have to travel more widely to find sufficient birds. In China, male birds of this species are killed, stuffed and sold as mascots, since their presence in the home is thought to confer happiness. On migration and in the wintering grounds, at least locally, birds are also trapped for "merit release" in temples. Since many populations on pristine breeding grounds have dropped rapidly, the decline is considered likely to have been driven by this heavy trapping.

3.2 Habitat destruction

Agricultural intensification, the shift to irrigated rice production and consequent loss of winter stubble have reduced the quality and quantity of wintering habitat, and the loss of reedbeds has reduced the number of available roost sites. In parts of the breeding range, there has been a reduction in habitat quality, including drying of meadows caused by changes in the flow pattern of rivers, a result of dam construction upstream.

3.3 Indirect threat

None known.

3.4 Threats connected especially with migrations

The large assemblages of birds on migration make them especially vulnerable to hunting (see Direct threats above).

3.5 National and international utilisation

Utilisation for food and other purposes is well demonstrated in China, and may occur in other Range States. There is no formal international utilisation.

4. Protection status and needs

4.1 National protection status

The bird is protected in its breeding range. Its status elsewhere is unclear, but at least some of the trapping referred to above is believed to be illegal at the national level. Where laws protecting the species do exist, it is likely that enforcement will be problematical in at least some cases.

4.2 International protection status

The species is not listed on Appendix II of the CMS.

4.3 Additional protection needs

A programme of co-ordinated monitoring is needed to determine the magnitude of the decline of this species. This should ideally be done at breeding, passage and wintering sites. The demand for the species as a snack-food and as a mascot needs to be reduced; the enactment of legislation and its enforcement are one approach; another is through education, and awareness campaigns. On the wintering grounds, sites that still hold large numbers of the species should be given protected status. Research leading to a better understanding of the bird's requirements at these sites would help to enable the protection and management of the most appropriate areas.

5. Range States[1]

BANGLADESH, BELARUS, Cambodia, China, FINLAND, INDIA, Japan, KAZAKHSTAN, Laos, MONGOLIA, Nepal, Russian Federation, Thailand, UKRAINE, Viet Nam.

6. Comments from Range States

7. Additional remarks

8. References

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BirdLife website: http://www.birdlife.org.datazone/species/index.html accessed 19th June 2008.

[1] CMS Parties in capitals.

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

A. PROPOSAL: Inclusion of the entire population of *Dendroica caerulea* population in Appendix I

B. PROPONENT: Government of Peru

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Aves
1.2	**Ordo**	Passeriformes
1.3	**Familia**	*Parulidae*
1.4	**Species**	*Dendroica caerulea*
1.5	**Common name(s)**	English: Cerulean Warbler French: Fauvette azurée; Paruline azurée Spanish: Bijirita azulosa; Verdín azulado; Gorjeador ceruleo; Chipe ceruleo; Reinita cerulea

2. Biological data

2.1 Distribution

The entire population of this species migrates. It breeds in eastern and central Canada and in the United States of America. The species winters in north-eastern South America, mainly in a narrow attitudinal zone east of the Andes, Colombia, Venezuela, Ecuador and Peru; perhaps a few individuals migrate accidentally to northern Bolivia each year.

2.2 Population

The population is estimated at 560,000 individuals, and is thought to have undergone a rapid decline. In addition, it is listed as Vulnerable by IUCN.

2.3 Habitat

It breeds in mature deciduous forests, often in the vicinity of swamps. The nest is built in the branch of a tree. Migrating birds are recorded from a variety of forest woodland, secondary growth and scrub habitats. Wintering birds are found in Andean submontane forest, mainly between 1,000 and 2,000 meters altitude. In parts of its wintering habitat, the species apparently has an affinity towards native species of the Genus *Inga,* in the shade of traditional coffee plantations where the *Inga* is a dominant species and whose flowers attract a wealth of insects.

2.4 Migrations

On its migration route, the species passes through the Bahamas, Cuba, Jamaica, and the Caribbean regions of Mexico, Belize, Guatemala, Honduras, Costa Rica and Panama. It reaches its breeding grounds in spring (April), takes off around July, and arrives at its wintering grounds in early August.

3. Threat data

3.1 Direct threat

Some sources believe that nest parasitism by *Molothrus ater* is a major threat leading to a decline in the population. Little is known about the potential effects of pesticides and other toxic substances.

3.2 Habitat destruction

Degradation of habitat through land use changes it the major threat to this species. Conversion of deciduous mature forests to farmland or urban areas, fragmentation and isolation of remaining mature forests, change to shorter rotation periods and even-aged management, and loss of key tree species to disease, are all threats at the breeding grounds. Wintering habitat is also threatened by conversion to other land uses such as pasture land, subsistence crops and coffee plantations. Coca plantations have a detrimental effect on primary forest habitat. Attempts to eradicate coca plantations can also potentially damage forests. High-altitude mining is a known, but as yet uncontrollable threat.

3.3 Indirect threat

None known.

3.4 Threats connected especially with migrations

The species migrates at night and collisions with pylons or artificial structures are frequent; it is not known as of yet whether this has a significant impact on the population of this species. Adverse climatic conditions in the Gulf of Mexico are known to kill the birds on their migrations in either direction. Should hurricane frequency increase drastically as a consequence of climate change, for example, this could have a detrimental effect on the species and other species with similar habits.

3.5 National and international utilization

None known.

4. Protection status and needs

4.1 National protection status

The species is protected in most of its range states.

4.2 International protection status

Not listed in Appendix II of CMS.

4.3 Additional protection needs

States parties where the species is not specifically protected should remedy this. Since the species appears to rely on primary forest ecosystems in its wintering grounds, those should be formally protected: this is particularly pressing for key sites. Prior to any mining activities in its forest habitat, environmental impact assessments must be conducted to ensure that measures are taken to prevent habitat loss and mitigate other negative consequences.

5. Range States[1]

Bahamas, Belize, Canada, Colombia, COSTA RICA, CUBA, ECUADOR, Guatemala, HONDURAS, Jamaica, Mexico, PANAMA, PERU, United States of America, Venezuela. Possibly also BOLIVIA.

6. Comments from Range States

7. Additional remarks

Even though the reproductive ecology and conservation status of the species have been widely studied in North America, very little is known about the species outside its breeding areas and period.

[1] CMS Parties in capitals.

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

A. PROPOSAL: Listing the entire population of *Acrocephalus sorghophilus* on Appendix I

B. PROPONENT: Government of the Philippines

C. SUPPORTING STATEMENT:

1. Taxon

1.1 Classis: Aves
1.2 Ordo: Passeriformes
1.3 Familia Sylviidae
1.4 Species: *Acrocephalus sorghophilus*
1.5 Common name(s): Streaked Reed-warbler; Speckled Reed Warbler

2. Biological data

2.1 Distribution

The entire population of the species is migratory. The breeding grounds are currently not known. They are presumed to lie in northeast China, with the provinces of Liaoning and Hebei having been suggested as possible locations. There is a single record of a male singing during the breeding season at Muraviovka, in the Amur region of far-eastern Russia; but follow-up surveys did not find any birds at the location. Winters in the Philippines, where it is local and uncommon; there are regular records from the Candaba wetlands and from Dalton Pass, both on the island of Luzon. It was also recorded once from Lake Baao, Camarines Sur also in Luzon.

2.2 Population

The population is estimated to be in the range 2,500 to 9,999 and decreasing. Because of the inferred small size of the population and the decrease that has been observed, the species is listed as Vulnerable by IUCN. Sightings of the species in the Philippines indicated a steep decline from 1980 to 2005. The species was not sighted in an April 2008 expedition to Candaba.

2.3 Habitat

The habitat on the breeding grounds is not known. In the Philippines in winter, it occurs in reed and grass marsh, often near water. On migration, it has been recorded from a marsh and from millet crops.

2.4 Migrations

The species has been recorded on migration in the (possible breeding) provinces of Liaoning and Hebei, and in Hubei, Jiangsu, Fujian and Beijing provinces in eastern China, as well as on the island of Taiwan (from where there are eight confirmed records). Spring passage in China is from late May to early June, and autumn passage from late August to early September. All records in the Philippines are from September to June.

3. Threat data

3.1 Direct threat

No direct threats to the birds, their nests or eggs are known.

3.2 Habitat destruction

This is considered likely to be the chief cause of the species decline. Loss of and damage to wetlands is occurring throughout its known range, and is considered likely to be an existing (or, at least, potential) threat to the unknown breeding grounds. On the wintering grounds, wetlands have been modified, for instance, by conversion to rice-cultivation, which results in draining in the crucial period of December and January. Reedbeds have been fragmented, including at the most important wintering site known for the species, and reduced in area by drainage, settlement and development (for instance, poultry-processing factories).

3.3 Indirect threat

The possible effects of climate change are unknown.

3.4 Threats connected especially with migrations

None known. As a nocturnal migrant, the bird is potentially vulnerable to collision with tall, illuminated structures, the number of which is rapidly growing along its flyway. Trapping migratory birds during moonless nights with the use of lights and nets is practiced at Dalton Pass. Two (2) specimens of the species preserved in liquid were seen by S. Pasicolan when she visited the site in 1988. The trapping of migratory birds at Dalton Pass has somehow abated but it could not be completely stopped due to poverty.

3.5 National and international utilisation

There appears to be no directed catch for the species but is anyway trapped together with other species and perhaps utilized as food.

4. Protection status and needs

4.1 National protection status

The species is not currently listed as protected in China or the Philippines, and such protection is highly desirable.

4.2 International protection status

As a member of the Muscicapidae *sensu lato*, the species is included on Appendix II of CMS. However, no CMS Agreements or other international initiatives currently cover or confer protection on the species.

4.3 Additional protection needs

Formal protection of wetlands where the species is known to occur is highly desirable. All the Range States are Parties to the Ramsar Convention. Despite uncertainties over the precise range of the species, it seems sure that the various current Ramsar designations in China and Russia cannot be contributing significantly to the conservation of this species. This species is totally reliant on the wetlands of the Philippines for its survival. Significant opportunities exist to further the bird's conservation in the country, in particular by the protection of wetlands and the management of their water levels. The best-known site of importance for the species at Candaba has been suggested as a Ramsar site, and educational material has been prepared. Ramsar designation, and the designation of the site under the National Integrated Protected Area System should be considered by the Philippine government. Further research is needed to investigate other suitable areas of marshland in the Philippines, to see if they hold the species, and would benefit from protection, management and designation. A ringing (banding) programme at Dalton Pass would also be of great value. Research work is desirable in China to discover the preferred breeding habitat, and the best breeding sites. This will enable an analysis of threats to the bird at the northern end of its flyway.

5. Range States[1]

China, PHILIPPINES, Russian Federation.

6. Comments from Range States

7. Additional remarks

The genus *Acrocephalus* responds well to the technique of tape-playback, and use of this technique as part of planned research effort may well help detect the presence of this species.

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Philip Round. personal communication.

Simplicia Pasicolan. personal communication.

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[1] CMS Parties in capitals.

Appendix II

Index

PROPOSALS

APPENDIX II

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: Islamic Republic of Mauritania

C. SUPPORTING STATEMENT

1. Taxon

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

2. Biological data

2.1 Distribution

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

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 IF AN 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

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

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 km^2 (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

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 les s 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, unles s 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

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

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 PNB A, 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 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[1]

Confirmed range states: MOROCCO, MAURITANIA, and SENEGAL.
Possible range state: The GAMBIA.

6. Comments from Range States

The proposal is supported by the Governments of the Gambia, Guinea, Guinea-Bissau, Senegal.

Islamic Republic of Mauritania- Species very sensitive to the disruptions (pollution, fishing activities, habitat degradation, etc.):
- Existence of an endemic population at the Cap Blanc (Mauritania).
- Scarce in stranding and in observation at sea.
- Lack of knowledge on the stock abundance.

[1] CMS Parties in capitals.

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

A. PROPOSAL: Add the Mediterranean population of *Grampus griseus* in Appendix II

B. PROPONENT: Government of Monaco

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Delphinidae
1.4	**Species**	*Grampus griseus* (G. Cuvier, 1812)
1.5	**Common name(s)**	English: Risso's dolphin Spanish: Delfín de Risso; Calderón gris French: Dauphin de Risso Italian: Grampo Croato: Pliscavica glavata

2. Biological data

Risso's dolphin (*Grampus griseus*) is abundant and widely distributed in tropical and warm temperate latitudes, (Jefferson et al. 1993), inhabiting mainly deep oceanic and continental slope waters (Baird 2002). Only in areas where the edge of the continental shelf is close to shore, are these animals likely to be observed in coastal waters.

Sighting records indicate this species occurs roughly between 60°N and 60°S latitudes, where surface water temperature are above 10 °C (Kruse et al. 1999). It ranges north to Newfoundland, the Shetland Islands, the North Sea (Weir et al. 2001), the Mediterranean Sea, 56°, 146° in the northern Gulf of Alaska, and Stuart Island (50°N) in British Columbia; and south down eastern South America as far as Cabo de Horns in Chile, to Cape Province in South Africa, Geographe Bay (33°S) in Western Australia, Sydney in New South Wales, North Island in New Zealand, and Valparaiso in Chile (Rice, 1998).

2.1 Distribution

In the Pacific ocean, water temperature appears to be a factor that affects the distribution of Risso's dolphins, the acceptable temperature range for the species being 7.5°C - 35°C (Kruse et al. 1999). In California, increasing numbers of Risso's dolphin and a shoreward shift in their distribution have been observed during periods of warm water, suggesting that seasonal patterns of distribution and abundance are associated with changing sea surface temperatures (Kruse et al. 1999).

Risso's dolphins occur in much of the Mediterranean Sea, although most reported sightings have been in the western basin. The greatest concentration is in the Ligurian-Corso-Provençal

basin, where the species is present all year-round. Risso's dolphins also occur seasonally in the southern Tyrrhenian Sea off the west coast of Ischia and between the island of Ustica and the Aeolian islands. They are observed regularly in the Balearic Sea and in the eastern half of the Alborán Sea (mainly from Seco de los Olivos to the Gulf of Vera) all year round. The apparent scarcity of Risso's dolphins in the eastern Mediterranean may be partly due to the paucity of observational effort there. A few sightings and strandings have been recorded along the coast of Israel and in the Aegean Sea. Risso's dolphins have been observed in the eastern Ionian Sea (Greece), around the western side of Crete and in the western Ionian Sea (Sicily). A few strandings have also been recorded in the northern Adriatic Sea. Few data are available for the southern Mediterranean Sea. This species is also found in Turkish coasts, such as Fethiye and Kalkan areas. Mixed-species groups of, striped and Risso's dolphins have been observed in the Ligurian sea, in the pelagic waters of the Gulf of Corinth, Greece (Frantzis and Herzing, 2002). They are absent from the Black Sea.

2.2 Population

No population estimates exist for this species in the Mediterranean. Line-transect abundance estimates exist only for the western central Mediterranean, where aerial survey from 2001-03 resulted in an estimate of 493 Risso's dolphins in an area of 32,270 km2 (Gómez de Segura et al. *in press*). In all surveyed areas, encounter rates have been relatively low. There is no baseline information on abundance, and therefore it is not possible to assess trends for the Mediterranean population.

Risso's dolphins in the Mediterranean Sea are genetically differentiated from those in the eastern Atlantic. This implies that gene flow between the two areas is limited or negligible, and that the Mediterranean population, should be considered as a distinct "management unit" (Gaspari et al. 2007). Furthermore, there is also some evidence of population structuring within the Mediterranean (Gaspari et al. 2007).

2.3 Habitat

Risso's dolphins are pelagic, mostly occurring seaward of the continental slope. They frequent subsurface sea-mounts and escarpments where they are thought to feed on vertically migrant and mesopelagic cephalopods.

Davis et al. (1998) and Baumgartner (1997) report that in the Gulf of Mexico, these dolphins were mostly found over deeper bottom depths, concentrating along the upper continental slope, which may reflect squid distribution. In Monterey Bay, California, Risso's dolphins are concentrated over areas with steep bottom topography. Currents and upwelling causing local increases in marine productivity may enhance feeding opportunities, resulting in the patchy distribution and local abundance of this species worldwide (Kruse et al. 1999).

In the Mediterranean Sea, Risso's dolphin show a preference for deep pelagic waters, in particular over steep shelf slopes and submarine canyons (Cañadas et al. 2002; Azzellino et al. 2008). They are distributed on an area of well-defined physiographic characteristics, particularly along the steeper sections of the upper continental slope. Their occurrence is higher where the slope gradient is steeper (Azzellino et al. 2008). Azzellino et al. (2008) also suggested a "transient" use of habitat in the Ligurian sea, to maximize food exploitation.

Blanco et al. (2003) analysed stomach contents of 13 Risso's dolphins stranded on the west Mediterranean coast between 1987 and 2002 and found only cephalopod remains: 25 species belonging to 13 families were found in the samples, mostly Argonautidae, Ommmastrephidae, Histioteuthidae and Onychoteuthidae. Despite the numerical importance and high frequency of small pelagic octopods, Blanco et al. (2003) assume that greater nutritional content came from of ommastrephids, because of their larger size of some specimens. According to the distribution records of prey in western Mediterranean, Risso's dolphins more frequently inhabit the outer continental slope and shelf break region. The preference for this habitat may be explained by the high marine productivity that enhanced feeding opportunities and this agrees with results from other countries and sightings in the area.

n the Mediterranean, Risso's dolphin groups size tend to be small to moderate in size, usually less than 100 (Azzellino et al 2008; Gaspari et al. *in prep*). Groups larger than 30 individuals are not common (Gaspari et al. *in prep*). In the Ligurian Sea, inter-individual associations within groups are mostly weak. However, some consistent relationships between individuals over periods of months and, in a few cases, years, exist (Gaspari, 2004). Limited evidence on genetic similarity among individuals within and among groups in the northwestern Mediterranean suggests that Risso's dolphins have a fluid social structure, but further investigation is needed (Gaspari, 2004). Hartman et al (2008) report groups ranging from two to 61 in the Azores.

2.4 Migrations

Although *Grampus* is present year round in most of its range, there may be seasonal onshore - offshore movements in some areas (Carwardine, 1995). *Grampus griseus* seems to be more abundant around northern Scotland in the summer and in the Mediterranean in the winter (Gannier 1998; Evans 1998). Similar seasonal shifts in abundance have been reported from the Northwest Atlantic, British coastal waters, and the south-east coast of South Africa. Summer "reproductive migrations" (characterised by schools of 20 - 30 animals with empty stomachs and females carrying large foetuses), and winter "feeding migrations" (characterised by schools of nearly 200 animals with full stomachs and females carrying smaller foetuses) have been observed off Japan (Mizue & Yoshida 1962). Dohl *et al* (1983) describes a correlation between population size, distributional expansion/contraction and water temperature in the southern Carolina Bight area, USA. They found that as the water cooled, Risso's dolphins appear to leave the Bight, moving offshore and to the south. Thus, it appears that abundance patterns fluctuate with sea surface temperatures independent of the season (Dohl *et al* 1983). Kruse (1989) reports that the dolphins were more abundant when the temperatures were stable than when large temperature fluctuations were recorded, suggesting that they prefer warmer well-mixed surface waters. Dohl *et al* (1983) reported that between 1980-1983, Risso's were moderately abundant all year on the north and central California coast during which time records showed only minor seasonal fluctuations. On the other hand, Forney and Barlow (1998) found no significant difference in distribution of Risso's dolphins in Californian waters. In both summer and winter, they were seen most frequently in the Southern California Bight and were also observed off central California. Risso's dolphins may also migrate regionally when environmental conditions change and in search for warmer waters and more prey.

In the Ligurian-Corso-Provençal basin, a core group of individuals is present during the summer and this group shows a degree of site fidelity (Airoldi et al. 2005). However, additional Risso's dolphins probably visit the area. Genetic data suggest a possible migration

during summer, to the Ligurian sea from other site of the Mediterranean Sea (Gaspari 2004). This aspect should be further investigated in order to understand Risso's dolphins population structure and possible patterns of seasonal migration.

3. Threat data

3.1 Direct threat to the population

Getting trapped as bycatch, entanglement, and pollution from coastal development pose the greatest threats to Risso's dolphins in the Mediterranean Sea. Evidence of by-catch of the species in swordfish driftnet fishery in the Mediterranean exists for the Aegean Sea, and along the coast of Spain and nord Africa.

Bycatches in longlines and gillnets have been reported in Spain (Valeiras *et al* 2001) and Italy (Notarbartolo di Sciara, 1990). There have been also some instances of accidental capture in fishing gear in Turkish coasts (Öztürk &Öztürk 1998).

3.2 Habitat destruction

Increasing levels of plastics and other refuse at sea may pose a threat to wild populations. Necropsies of specimens from Japan revealed that they had eaten foreign materials such as plastic bags, soda cans, and pieces of rope, which may have been fatal (Kruse et al. 1999).

3.3 Indirect threat

Accumulation of butyltin compounds, organochloride and DDT levels have been analysed in tissue samples from various specimens (Kruse et al. 1999). Risso's dolphins in the Mediterranean carry substantial contaminant burdens (Kim *et al* 1996, Marsili & Focardi 1997, Shoham-Frider *et al* 2002, Fossi & Marsili 2003). Mercury levels were determined in the tissues and organs (lung, liver, kidney, skin, muscle, bone) of Risso's dolphin by Frodello et al. (2000). The variation in mercury levels between the different tissues and organs (lung, liver, kidney, skin, muscle, bone) of the cetacean species are discussed as regards storage, biotransformation and elimination. The liver appears to be the preferential organ for mercury accumulation (with concentrations as high as 3298 mg Hg/g in the livers of *Grampus griseus*).

There are other several reports in the literature on beached *Grampus griseus* specimens, but not in the context of trace metals (Kim et al. 1996; Lawson and Eddington, 1998; Van Bressem et al. 1989). Traces of metal concentrations were reported by Zonfrillo et al. (1988)10, Law (1997) and Law et al. (2001) in liver tissue of three *Grampus griseus* specimens from the UK, by Storelli et al. (1999) in various tissues of two specimens from the southern Adriatic Sea, and by Frodello et al. (2000) in one specimen from the western Mediterranean. High concentrations of trace metals were found in one *Grampus griseus* specimen, but no connection could be found between them and the autopsy results, which showed no remarkable findings in the internal organs. This and the similar high concentrations found in three other specimens from the Mediterranean led to the assumption that the high concentrations are a result of the high trophic level of this species, its diet and its old age (E. Shoham-Frider et al. 2002).

Sound pollution is a threat to deep-diving pelagic cetaceans, including Risso's dolphins. Although there are no records of Risso's dolphin strandings in the Mediterranean Sea directly attributable to noise, consistent with a syndrome related to exposure to high-intensity sonar has been described in this species in the UK (Jepson et al. 2005).

3.4 Threat connected expecially with migrations

3.5 National and international utilization

There is no evidence of exploitation of the species in the Mediterranean. Elsewhere, these dolphins are killed for human consumption in some areas and have been sold on the open market in Taiwan. They are also caught in Japan and in Sri Lanka, where their commercial popularity increased when fisheries began selling their incidentally caught dolphins. In Sri Lanka, Risso's dolphins are apparently the second most commonly taken cetacean in fisheries, providing fish and meat for human consumption and fish bait; stocks there may be adversely affected (Jefferson et al. 1993). An estimated 1.300 Risso's dolphins may be landed annually as a result of this fishery and population estimates in these waters range only from 5.500 to 13.000 animals (Kruse et al. 1999). In Japan, Risso's dolphins are taken periodically for food and fertiliser in set nets and as a limited catch in the small-type whaling industry (Kruse et al. 1999).

4. Protection status and needs

4.1-2 National and International and protection status

Grampus griseus is listed in CITES Appendix II ; in Annex II of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean; in Appendix II of the Convention on the Conservation of European Wildlife and Natural Habitats. The North and Baltic Sea populations are included in Appendix II of CMS. The Mediterranean population is fully protected under ACCOBAMS.

Grampus griseus is assessed as "Data Deficient" in the IUCN Red Data list.

4.3 Additional protection needs

To date no specific conservation measures have been taken for Risso's dolphins in the Mediterranean Sea. The existence of a Marine Sanctuary for cetaceans in the Corso-Ligurian Basin, has proved to be of great value for the study of this species. In fact, the majority of detailed studies of Risso's dolphins within the Mediterranean, took place in the Sanctuary. It is therefore advisable to increase and geographically expand the research effort on the Risso's dolphin, to identify suitable habitats for the conservation of this species within the Mediterranean Sea. Furthermore, considering the relative low occurence of the species in the Mediterranean, the lack of information on population trends, and the recent genetic findings; which define mediterranean Risso's dolphin as a distinct population, and assume the existence of sub-populations within the Mediterranean, it advisable to assess, whether distinct populations of Risso's dolphins do exist. The description of their genetic and demographic characteristics can help directing conservation efforts for the protection of distinct populations and the maintenance of biological diversity in Mediterranean Sea.

5. Ranges states[1]

Occurrence of the species has been proved in the following Mediterranean riparian states: ALGERIA, CROATIA, CYPRUS, FRANCE, GREECE, ISRAEL, ITALY, LYBIA, MALTA, MAROCCO, MONACO, SPAIN, UNITED KINGDOM (Gibraltar).

6. Comments from Range States

7. Additional remarks

There is limited information regarding population size of Risso's dolphin. However, there is some evidence that this dolphin may be at risk of depletion if fishery-related mortalities remain at current levels. Pollution is the other major factor affecting the population of Risso's dolphins.

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[1] CMS Parties in capitals.

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

A. PROPOSAL: Change listing in Appendix II of *Tursiops truncatus* from "western Mediterranean population" to "Mediterranean population"

B. PROPONENT: Principality of Monaco

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Delphinidae
1.4	**Species**	*Tursiops truncates* (Montagu. 1821)
1.5	**Common name(s)**	English: Bottlenose dolphin French: Grand dauphin, Dauphin souffleur Spanish: Delfín mular Albanian: Delfin i madh Arabic: ???? ? ???O (Delfin kabir) Croatian: Dobri dupin (Dolphinan yam hatichon) Hebrew: ????'? - ?? ?????? Italian: Tursiope Maltese: Delfin geddumu qasir Turkish: Afalina

2. Biological data

2.1 Distribution

Bottlenose Dolphins have been reported to mostly occur the coastal waters of the all Mediterranean basin. They are considered regular off Algeria (Boutiba *et al.*, 2003), Croatia (Bearzi *et al.*, 1997), Cyprus (Hadjichristoforou, 2004), France (Deguy & Cyrus 1973; Duguy et al., 1983; Ripoll *et al.*, 2004; Dhermain, 2006), Greece (Frantzis *et al.*, 2003), Israel (Feingold *et al.*, 2005; Scheinin *et al.*, 2005), Italy (Notarbartolo *et al.*, 1993), Morocco (Bayed, 1997), Slovenia (Genov & Kotnjek, 2007), Spain (Cañadas *et al.*, 2002; Raga & Pantoja, 2004; Cañadas & Hammond, 2006), Tunisia (Chakroun, 1994; Ben Naceur *et al.*, 2004) and Turkey (Öztürk *et al.*, 2004).

The Bottlenose Dolphin is one of the most common cetacean species in the Mediterranean, after the Striped Dolphin *Stenella coeruleoalba*, particularly in continental shelf waters (Bearzi *et al.*, 2008). Bottlenose Dolphins are highly adaptable and inhabit a wide variety of habitats including lagoons and enclosed seas (Bearzi & Ferretti 2000; Bearzi *et al.*, 2007a), deep areas with steep bottom gradients (e.g. around Crete; Frantzis *et al.*, 2003), productive waters 200-500 m deep (e.g. in the Alborán Sea; Cañadas & Hammond, 2006), and the

channels and shelf waters of archipelagos (Pulcini *et al*., 1993; Bearzi *et al*., 1997; Impetuoso *et al*., 2003; Mussi & Miragliuolo, 2003; Forcada *et al*., 2004). Many of the Mediterranean areas inhabited by these dolphins are subject to intensive human use, e.g. the straits of Gibraltar, Bonifacio, and Messina (Romeo *et al*., 2003; Raga & Pantoja 2004; Dhermain, 2006), and the gulfs of Lion, Genova, and Trieste (Francese *et al*., 1999; Ripoll *et al*., 2004; Gnone *et al*., 2006). Bottlenose Dolphins are also found around oil and gas drilling platforms in the Adriatic Sea (Triossi & Tizzi, 2003). Within their overall range, gaps with very low densities of animals have been documented, e.g. in the north-western Ligurian Sea (France and Italy) and in the north-western Gulf of Vera (Spain). Variation in density is likely related to several factors, including a) habitat characteristics, b) local availability of suitable prey, and c) the generally gregarious nature of Bottlenose Dolphin communities. Moreover, the effects of past extermination campaigns (Bearzi *et al*., 2004a) and a variety of ongoing threats probably have contributed to the pattern of present-day occurrence of Bottlenose Dolphins across the region.

See section 2.3 (Habitat) for more details.

2.2 Population

2.2.1 Numbers: absolute and relative abundances

Little is known about the numbers of Bottlenose Dolphins in the Mediterranean Sea. There is no basin-wide estimate. The most reliable information comes from local studies conducted in the Strait of Gibraltar (Pérez *et al*., 2006), Alborán Sea (Cañadas, 2006; Cañadas & Hammond, 2006), the Spanish waters between Gulf of Valencia and Gulf of Vera (Gómez de Segura *et al*., 2006), Balearic Sea (Forcada *et al*., 2004), a small portion of the Italian waters (Lauriano *et al*., 2003), the Tunisian plateau (Ben Naceur *et al*., 2004), the northern Adriatic Sea (Fortuna *et al*., 2000), Maltese waters (Vella, 1999), portions of the Turkish and Greek seas (Bearzi *et al*., 2007a). These numbers are based on different methodological approaches, including absolute abundance estimates obtained through mark-recapture methods or Generalized Additive Models (GAMs), maximum number of photo-identified individuals, and discovery curves (i.e. curves showing the cumulative number of individual dolphins identified as a function of photo-identification effort, usually expressed as survey days with photos). Additional information that could in future increase the number of available absolute estimates for different areas exist for Lampedusa Island (Italy; Pulcini *et al*., 2004), northern Adriatic Sea (Bearzi *et al*., 2007b; Genov & Fortuna, 2005), Central Adriatic Sea (Kornati and Murtar Sea, Croatia; Impetuoso *et al*., 2003), Eastern Ionian Sea (Greece; Bearzi *et al*., 2005, 2006), Amvrakikos Gulf (Greece; Bearzi *et al*., 2007a), Ligurian Sea and northern Tyrrhenian Sea (Italy; Gnone *et al*., 2006), Gulf of Catania (Italy; Tringali *et al*., 2004), Waters off Corsica (France; Dhermain 2006), Eastern Ionian Sea (Greece; Bearzi *et al*., 2005), Mediterranean waters of Israel (Scheinin *et al*., 2005). Most studies in coastal waters are limited to relatively small areas of 400 – 1,000 km^2 and likely do not cover the entire range of the groups under study. Relatively recent, broad-scale shipboard surveys (4,000 – 80,000 km^2) showed that in some Mediterranean areas Bottlenose Dolphins are present both near shore and offshore, and densities can range between 4 and 20 animals per 100 km^2 (Ben Naceur *et al*., 2004; Forcada *et al*., 2004; Cañadas & Hammond, 2006; Gómez de Segura *et al*., 2006). In this situation, the total population size in the Mediterranean remains uncertain, but it is unlikely to exceed the low 10 000s (Bearzi & Fortuna, 2006).

Little information exists for other parts of the Mediterranean basin where only information on past and present occurrence comes from stranding records. Virtually nothing is known on abundances for large portions of the south-eastern part of the basin.

2.2.2 Population structure

Based on nuclear and mitochondrial DNA analyses, Mediterranean Bottlenose Dolphins resulted as genetically differentiated from those inhabiting the contiguous eastern North Atlantic Ocean and the Black Sea (Natoli *et al*., 2005). The genetic analysis of 74 samples collected along a continuous distributional range from the Mediterranean Sea showed some degree of population structure with boundaries that coincide with the transitions between habitat regions. These regions can be characterized by ocean floor topography and by features such as surface salinity, productivity and temperature (Natoli *et al*., 2005).

2.3 Habitat

Bottlenose Dolphins in the Mediterranean are often regarded as predominantly 'coastal' or 'inshore' animals but this designation may be misleading as they can be encountered in continental shelf and shallow plateaux waters at any distance from the coast of either main land and islands (Notarbartolo di Sciara *et al*., 1993; Bearzi *et al*., 1997; Triossi & Tizzi 2003; Bearzi *et al*., 2004a; Ben Naceur *et al*., 2004; Cañadas *et al*., 2004; Gómez de Segura *et al*., 2004; Ripoll *et al*., 2004; Gannier, 2005), but also in straits, gulfs, eutrophic waters of estuaries and lagoons steep coasts with no continental shelf and deep waters of the continental slope (Cañadas *et al*., 2002; Bearzi & Ferretti 2000; Frantzis *et al*., 2003; Zafiropoulos & Merlini, 2003; Cañadas *et al*., 2004; Forcada *et al*., 2004; Gómez de Segura *et al*., 2004; Bearzi *et al*., 2005, 2007a). This species usually favours depths shallower than 200 m (Pace *et al*., 1999; Mussi *et al*., 1998; Gazo *et al*., 2004b; Gnone *et al*., 2006; Gonzalvo *et al*., 2004; Manoukian *et al*., 2004).

2.4 Migrations

Even though bottlenose dolphins can display rather strong site fidelity, they showed to have quite wide ranges in European waters, up to 400 km (Wilson *et al*., 2004). In the Mediterranean Sea, coast-to-coast movements across open seas occur covering over 200 km, in Ligurian Sea, between Corse and Italy (Dhermain *et al*., 199), in the Adriatic Sea, between Slovenia, Croatia and Italy (Fortuna 2006). In addition, transnational mouvement are very likely to occur between the continental waters of Lampedusa Island (Italy) and Tunisia (Pulcini *et al*., 2004; Ben Naucer *et al*., 2004), the eastern Aegean waters between Greece and Turkey (Frantzis *et al*., 2003).

3. Threat data

Owing to their occurrence in coastal waters, bottlenose dolphins in the Mediterranean are exposed to a wide variety of human activities. Whilst intentional killing was likely the most important cause of mortality until the 1960s (see previous section), important ongoing threats include incidental mortality in fishing gear and the reduced availability of key prey caused by region-wide overfishing and environmental degradation. Additional potential or likely threats include the toxic effects of xenobiotic chemicals, epizootic outbreaks, direct disturbance from boating and shipping, noise, and the consequences of climate change. It is worth noting that this same array of known and potential threats applies to riverine, estuarine and coastal

cetaceans (and other groups of organisms) in many other parts of the world as well (e.g. Reeves *et al*., 2003).

3.1 Direct threat of threat of the population

3.1.1 Illegal trade

The level of illegal trade is unknown. At present, live capture of bottlenose dolphins is prohibited in all Black Sea countries except for Turkey where permits for the live capture of 30 animals in the Black, Marmara, Aegean and Mediterranean Seas were issued and realized at least in part (23 captures were reported) during 2006 and 2007 (Convention on the Conservation of European Wildlife and Natural Habitats 2007).

3.1.2 Direct catch, captive breeding for commercial purposes (outside the country of origin)

Direct catches were common in the past throughout the entire Mediterranean Sea, mainly in the framework of national fishery management schemes (Gourret, 1894; Barone, 1895; Del Rosso, 1905; Peksider-Srica, 1931; Brunelli, 1932; Crnkovic, 1958; Cuculic, 1960; Marelic, 1961; Duguy *et al*., 1983; Bompar, 2000; Bearzi *et al*., 2004a). Dolphins were considered detrimental for fisheries in terms of competition for the same resources, but in some area they were also considered as target species (Bearzi *et al., in press*). The overall frequency of intentional killing has been drastically declining over the long term due to new legislation granting cetacean protection in most Mediterranean countries. At the present there are not known direct catches; however killing in retaliation for damage to fisheries, killing with harpoons or guns for local consumption of meat have been reported in the past in Ligurian and Tyrrhenian seas, notwithstanding legal protection (Di Natale, 1990; Di Natale & Notarbartolo di Sciara, 1994). Such events seem to have become extremely rare in recent times, but they may still occur.

3.1.3 Incidental catch and commercial exploitation

Due to their opportunistic behaviour and predominantly coastal occurrence, Bottlenose Dolphins in the Mediterranean are often exposed to entanglement in many types of fishing gear, in most of the Mediterranean countries, including Algeria, Croatia, France, Greece, Israel, Italy, Malta, Morocco, Spain, Tunisia, and Turkey (Di Natale, 1990, 1995; Consiglio *et al*., 1992; Silvani *et al*., 1992; Di Natale & Notarbartolo di Sciara, 1994; Öztürk *et al*., 2001; Boutiba *et al*., 2003; Raitsos *et al*., 2003; Roditi-Elasar *et al*., 2003; Tudela *et al*., 2005; Kent *et al*., 2005; Brotons *et al*., 2006; Díaz López, 2006b; Fortuna, 2006; Van Canneyt & Peltier, 2006). Large pelagic driftnets (Di Natale & Notarbartolo di Sciara, 1994; Öztürk *et al*., 2001), small pelagic driftnets (Di Natale & Notarbartolo di Sciara, 1994), set nets (Silvani *et al*., 1992; Di Natale & Notarbartolo di Sciara, 1994; Raitsos *et al*., 2003; Brotons *et al*., 2006; Díaz López, 2006b), bottom trawls (Silvani *et al*., 1992; Goffman *et al*., 2001; Feingold *et al*., 2005; Brotons *et al*., 2006), purse seines (Bradai, 2001), traditional tuna traps (Di Natale & Notarbartolo di Sciara, 1994) and antipredator nets used in aquaculture facilities (Díaz Lopez & Bernal Shirai, 2007). In addition to incidental mortality, depredation and damage caused by dolphins to fishing gear may result in animals being shot or harassed in retaliation (Di Natale, 1990; Silvani *et al*., 1992; Di Natale & Notarbartolo di Sciara, 1994; Commission of the European Communities, 2002; Fernández-Contreras *et al*., 2002; Gazo *et al*., 2004a; Mitra *et al*., 2004; Blasi & Pace, 2006).

Few attempts have been made to estimate fishery-related mortality for Bottlenose Dolphins (Silvani *et al*., 1992; Di Natale, 1995; Díaz Lopez, 2006b; Díaz Lopez & Bernal Shirai, 2007) and the magnitude of bycatch and retaliation events is unknown in most cases. Even when

they are available, bycatch estimates are partial in terms of geographic and gear coverage. However, the available studies and circumstantial evidence for local populations raise serious concern, suggesting that annual fishery-induced mortality is locally unsustainable in at least some cases (Silvani *et al*., 1992; Brotons *et al*., 2006; Díaz Lopez, 2006b; Fortuna 2006; Díaz Lopez & Bernal Shirai, 2007). Rigorous studies of bycatch rates using reliable methods, which normally must include on-board observers and a statistically robust sampling design, are needed to obtain credible estimates of mortality. It is then incumbent to determine 'sustainability' by reference to the population size, also taking into account other existing threats.

In recent years, takes due to illegal fisheries has been reported off Morocco (Tudela, 2004), Spain (Silvani *et al*., 1992; Gazo *et al.*, 2004a; Tudela, 2004), Italy (Consiglio *et al.*, 1992; Blasi & Pace, 2006) and Greece (Mitra *et al*., 2004).

The persisting illegal use of dynamite for fishing in several Mediterranean areas, including Algeria, Croatia, France, Greece, Lebanon, Libya and Malta (Di Natale, 1990; Reynolds *et al*., 1994; Tudela, 2004; Fortuna, 2006; Notarbartolo di Sciara *et al*., 2006; Dhermain & Cesarini, 2007), represents another fishery-related threat to Bottlenose Dolphins. Though impact at the basin level is probably low, it may be significant locally (Fortuna 2006).

3.2 Habitat destruction

3.2.1 Lack of food resources

Overlap between dolphin prey species and fishery target species does not necessarily imply direct competition (Briand, 2004). However, it is reasonable to infer competitive interactions of some kind when key prey become scarce and remain subject to heavy fishing pressure (Trites *et al.*, 1997). In this regard, we note that about 95% of marine-fish catches globally come from continental shelf regions (Roberts & Hawkins, 1999) where Bottlenose Dolphins occur. Overfishing is having profound direct and indirect impacts on Mediterranean ecosystems (Sala, 2004). In the Mediterranean there is an acute lack of historical data and fisheries statistics are generally incomplete and unreliable, data on fishing effort being almost absent (Briand, 2000, 2003; Lleonart, 2005). Nonetheless, it is generally acknowledged that unsustainable fishing has contributed significantly to dramatic ecological changes and caused the decline of many fish stocks (Caddy & Griffiths, 1990; De Walle *et al.*, 1993; Stanners & Bourdeau, 1995; Caddy, 1997). According to FAO, approximately 35% of the Mediterranean stocks are exploited beyond MSY levels, and 43% at MSY levels (Garcia *et al.*, 2005). Some of the Mediterranean fish stocks that have been either 'overexploited' or 'fully exploited' include important Bottlenose Dolphin prey such as European Hake, Striped Red Mullet, European Pilchard, Common Pandora *Pagellus erythrinus*, Annular Seabream *Diplodus annularis*, and Atlantic Horse Mackerel *Trachurus trachurus* (Lleonart, 2005).

Yet, the fact that availability of Bottlenose Dolphin prey is strongly influenced by fishing pressure, with potential consequences on dolphin density, status and population trends is rarely taken into due consideration. Reduced carrying capacity due to overfishing was proposed as one explanation for the low densities of Bottlenose Dolphins in the Adriatic and Ionian Seas (Bearzi *et al*., 1999, 2005a, 2006). Conversely, dolphin densities tend to be high in areas where prey is still abundant. For instance, dolphin density in the prey-rich Amvrakikos Gulf, Greece - where effective fishery management measures including the prohibition of purse seining and trawling are in place - is one order of magnitude higher than in the overfished waters of the nearby island of Kalamos (Bearzi *et al*., 2006, 2007a; Table 2).

3.2.2 Disease

Epizootic outbreaks appear to have affected Bottlenose Dolphins to a lesser extent than other Mediterranean delphinids, such as the Striped Dolphin (Aguilar & Raga, 1993; Van Bressem *et al*., 1993). Morbillivirus infections have been reported in one individual Bottlenose Dolphin stranded on the Mediterranean coast of Israel in 1994 (Tsur *et al*., 1997), and one stranded in Mauritania (Atlantic coast of West Africa) in 1988 (Van de Bildt *et al*., 2001). However, Bottlenose Dolphins elsewhere have experienced mass mortality from such outbreaks, e.g. in Black Sea waters (Birkun *et al*., 1998) and on the Atlantic coast of the United States, where more than half of one local population may have died (Lipscomb *et al*., 1994; Duignan *et al*., 1996; Schulman *et al*., 1997). As epizootic phenomena may be related to immune-system compromise induced by exposure to xenobiotics and/or by stress from poor nutrition (Aguilar & Borrell, 1994; Calzada *et al*., 1996; O'Shea & Aguilar, 2001), the risk of disease outbreaks in Bottlenose Dolphins in the Mediterranean may be considerable.

Toxoplasmosis that can cause mortality in many species of domestic and wild animals (Dubey *et al*., 2003), were also found in specimen of bottlenose dolphins in Mediterranean Sea (Di Guardo *et al*., 1995a, 1995b; Cabezon *et al*., 2004).

3.3 Indirect threat

Toxic contamination is a major concern in marine mammal populations because of the potential effects on reproduction health and DNA damage (Gauthier *et al*., 1999; O'Shea *et al*., 1999; Fossi & Marsili, 2003; Newman & Smith 2006). The Bottlenose Dolphins' worldwide distribution and great adaptability to diverse habitats make this species a good indicator of the quality of inshore marine ecosystems.

Contaminant levels, particularly of organochlorine compounds, in Mediterranean Bottlenose Dolphins are very high compared to the levels reported for Bottlenose Dolphins in other areas (Corsolini *et al*., 1995; Marsili & Focardi, 1997; Aguilar *et al*., 2002; Fossi & Marsili, 2003; Wafo *et al*., 2005; Borrell *et al*., 2006; Borrell & Aguilar, 2007). At concentrations similar to or lower than those documented for Mediterranean Bottlenose Dolphins, compounds such as PCBs or PAHs have been associated with reproductive disorders, immune-system suppression, and neoplasia in other populations of Bottlenose Dolphins (Lahvis *et al*., 1995; Reddy *et al*., 2001; Schwacke *et al*., 2002; Jaber *et al*., 2005; Hall *et al*., 2006). Although organochlorine contamination is decreasing in some areas, levels in Mediterranean Bottlenose Dolphins remain high (Tolosa *et al*., 1997; Aguilar & Borrell, 2004; Borrell & Aguilar, 2007). Constant monitoring of toxic elements, improvement in developing suitable biomarkers and risk assessment frameworks must be among the priorities for the conservation for such coastal species (Schwacke *et al*., 2002; Fossi & Marsili 2003; Jaber *et al*., 2005; Porte *et al*., 2006).

Various and sometimes high levels of heavy metals have been found in stranded Bottlenose Dolphins from the Mediterranean (e.g. Leonzio *et al*., 1992; Frodello *et al*. 2000; 2002; Roditi-Elasar *et al*., 2003; Lahaye *et al*., 2006). The impact of these metals at the population level is unknown.

3.4 Threat connected especially with migrations

3.5 National and international utilization

4. Protection status and needs

4.1&2 National and International protection status

Cetaceans are protected by law in most Mediterranean countries (Bearzi *et al*., *in press*). In addition, the existing legislative and treaty instruments in force today provide a potentially solid framework for the conservation of cetaceans in this region.

The western Mediterranean bottlenose dolphin population is listed in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

The bottlenose dolphin is also listed in Appendix II (Strictly Protected Fauna Species) of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention).

This species is fully protected Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS).

Two protocols of the Barcelona Convention address issues of direct relevance to the bottlenose dolphin in the Mediterranean basin. These are: 1) Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (Offshore Protocol): 1994a; 2) Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (LBS Protocol); and 3) Protocol for Specially Protected Areas and Biological Diversity in the Mediterranean (SPA and Biodiversity Protocol).

An other international initiative relevant to Mediterranean bottlenose dolphin protection is the UN Environment Programme (UNEP) Mediterranean Environmental Action Plan - Action Plan for the Conservation of the Cetaceans in the Mediterranean Sea.

In addition, for the Mediterranean European Countries, the following Directives and Regulation are of particolar importance in terms of conservation of bottlenose dolphins in the Mediterranean region: 1) Council Directive No 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive); 2) Council Regulation (EC) No 1626/94 of 27 June 1994, laying down certain technical measures for the conservation of fishery resources in the Mediterranean Sea; 3) Council Regulation (EC) No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein (*Tursiops truncatus* is listed in Appendix II); and 4) Council Regulation (EC) No 812/2004 of 26 April 2004, laying down measures concernine incidental catches of cetaceans in fisheries and amending Regulation (EC) No 88/98.

Tursiops truncatus is listed as "Data Deficient" in the IUCN Red List (Source: http://www.iucnredlist.org/search/search-basic); however the Mediterranean bottlenose dolphin, as a whole, has been recently proposed by an IUCN-ACCOBAMS Workshop as "Vulnerable" (Bearzi & Fortuna 2006). This proposal is currently under scrutiny.

4.3 Additional protection needs

Populations of *Tursiops truncatus* in the North and Baltic Seas, western Mediterranean and Black Sea are currently listed in Appendix II of CMS, but not the Bottlenose Dolphins of the eastern Mediterranean Sea. Given the fact that there are not scientific reasons that would suggest to treat the Mediterranean Bottlenose dolphins as divided into two populations, it is believed that this rather peculiar listing was most likely due to a mistake. Alternatively the previous listing could have been affected by the past almost total lack of information on Cetaceans species in the eastern Mediterranean Sea. However, since individuals of *Tursiops truncatus* in the Mediterranean Sea can either be resident, share a wide home range or migrate, it is suggested that all *Tursiops truncatus* populations should be included in App. II of CMS.

4.4 Recent initiatives for increased protection

ACCOBAMS is preparing a Mediterranean Action Plan.

5. Ranges states[1]

Listing of states where the occurrence of species has been proved:
ALBANIA, ALGERIA, Bosnia-Herzegovina, CYPRUS, CROATIA, FRANCE, GREECE, ISRAEL, ITALY, Lebanon, LYBIA, MALTA, MONACO, Montenegro, MOROCCO, PORTUGAL, SYRIA, SLOVENIA, SPAIN, TUNISIA, Turkey, UNITED KINGDOM (Gibraltar).

6. Comments from Range States

7. Additional remarks

Preserving populations that are biologically unique and geographically isolated is recognised as an international priority for conservation. The Mediterranean Bottlenose Dolphins are genetically differentiated from those of the Atlantic (Natoli *et al*. 2005). Therefore, the whole Mediterranean bottlenose dolphins should be listed in Appendix II, not only the Western Mediterranean group.

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PROPOSAL FOR THE 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: Guinea-Bissau

C. SUPPORTING STATEMENT:

1. Taxon

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

2. Biological data

2.1 Distribution

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

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

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

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

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 carcasses. 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

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

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)[1]

Confirmed range states: ANGOLA, CONGO, GAMBIA, GHANA, MAURITANIA and SENEGAL.
Presumed range states: BENIN, CAMEROON, CÔTE D'IVOIRE, DEMOCRATIC REPUBLIC OF CONGO, Gabon, GUINEA, GUINEA-BISSAU, LIBERIA, NIGERIA, Sierra Leone, SAO TOMÉ AND PRINCIPE AND TOGO.

6. Comments from Range States

a) Guinea-Bissau
The expedition undertaken by the Japanese Cooperation at the end of 2002 to survey cetaceans in the waters of Guinea Conakry, Guinea-Bissau, Senegal, Gambia and Mauritania did not report any sightings in those countries (Yoshida *et al*., 2002).

b) Angola
Angola supports this proposal. Research institutions in Angola have confirmed the situation concerning the species. Information collected during annual expeditions showed a reduction in the species' presence and numbers in Angola waters. Angola is therefore in favour of the proposal.

[1] CMS Parties in capitals.

7. Additional remarks

None.

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

A. PROPOSAL: Inclusion of the African Wild Dog *Lycaon pictus* on Appendix II

B. PROPONENT: Government of Kenya

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Carnivora
1.3	**Familia**	Canidae
1.4	**Species**	*Lycaon pictus* Temminck 1820
1.5	**Common name(s)**	English: African wild dog French: Cynhyène Spanish: Licaon

2. Biological data

2.1. Distribution

The African wild dog's historic and current geographic ranges are shown in Figure 1 below. Historical data indicate that wild dogs were formerly distributed throughout sub-Saharan Africa, from desert (Lhotse, 1946) to mountain summits (Thesiger, 1970), and probably were absent only from lowland rain forest and the driest desert (Schaller, 1972).

Wild dogs have disappeared from much of their former range; less than 6% of the species' historical range is still known to support resident populations. Wild dogs have been virtually eradicated from West Africa, and greatly reduced in central and northeastern Africa. The largest populations remain in southern Africa (especially northern Botswana, western Zimbabwe, and eastern Namibia) and in the southern part of eastern Africa (especially Tanzania and northern Mozambique).

2.2. Population

Table 1 provides estimates of the sizes of known resident populations; these estimates were reached using a variety of methods and are associated with a substantial (though unknown) margin of error. Nevertheless they suggest a global total of fewer than 8,000 animals, in fewer than 800 packs (social groups). Since wild dogs' social system means that only a single male and a single female breed in each pack (Malcolm & Marten, 1982; Creel *et al.*, 1997), the genetic effective population size is substantially smaller than the total number of individuals.

Wild dogs are classified in the IUCN red data book as endangered (EN: C2b) on the basis of small population size and ongoing decline (Woodroffe, McNutt & Mills, 2004; IUCN, 2006).

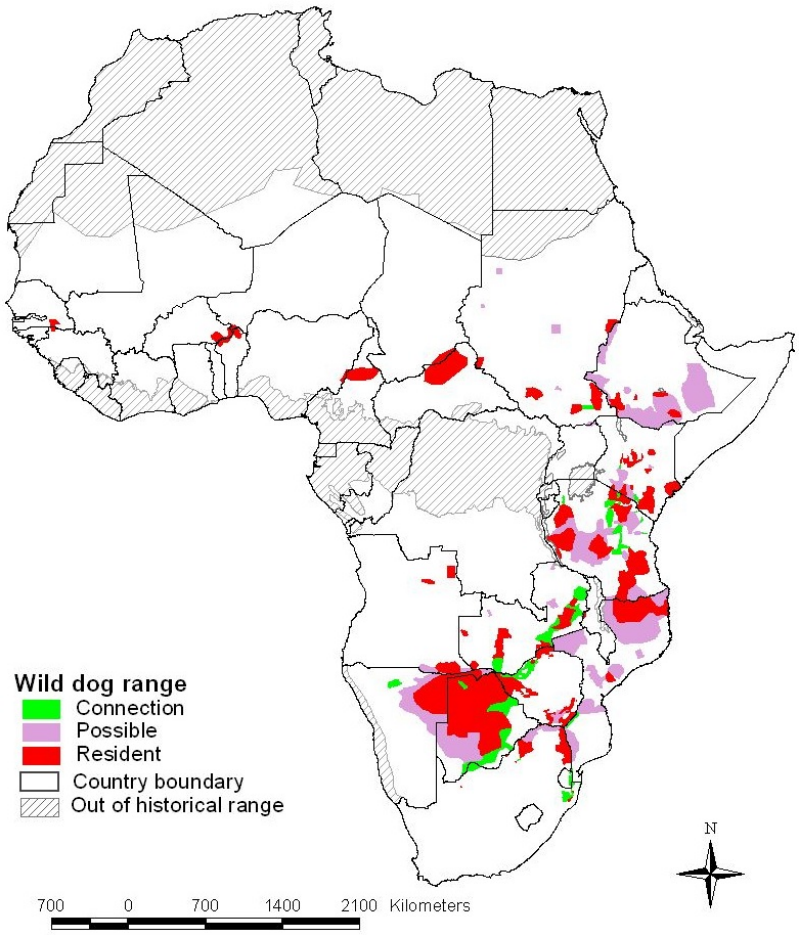

Figure 1 *– Distribution and status of African wild dogs, estimated in 2007. Areas shaded in red are known to support resident populations; areas shaded purple may support resident populations; areas shaded green do not support resident wild dogs but provide landscape connections which are known or suspected to allow dispersal between populations. Data are from IUCN/SSC (in press), IUCN/SSC (in prep), Breuer (2003), Fanshawe (1997) and P. Chardonnet & M. Pellerin (unpublished data).*

2.3. Habitat

African wild dogs are generalist predators, occupying a range of habitats including short-grass plains, semi-desert, bushy savannahs and upland forest. While early studies in the Serengeti National Park, Tanzania, led to a belief that wild dogs were primarily an open plains species, more recent data indicate that they reach their highest densities in thicker bush and woodland (*e.g.*, Selous Game Reserve, Tanzania; northern Botswana). Several relict populations occupy dense upland forest (e.g., Harenna Forest, Ethiopia, Malcolm & Sillero-Zubiri, 2001). Wild dogs have been recorded in desert (Lhotse, 1946), although they appear unable to establish themselves in the southern Kalahari, and in montane habitats (Thesiger, 1970; Malcolm & Sillero-Zubiri, 2001), although not in lowland forest. It appears that their current distribution is limited primarily by human activities and the availability of prey, rather than by the loss of a specific habitat type.

2.4. Migrations

African wild dogs have extremely large home ranges, far larger than would be predicted on the basis of their food requirements. Pack home ranges vary in size from 150-4,000km^2, with annual home ranges averaging 6-800km^2 (Woodroffe & Ginsberg, 1997). This wide-ranging behaviour is apparently a response to the risk of predation.

Table 1 *– Known resident populations of free-ranging African wild dogs. Estimates of population size and extent are approximate and have a wide margin of error. Data are from IUCN/SSC (in press), IUCN/SSC (in prep), Breuer (2003), and Woodroffe et al. (2004).*

Name	**Country or countries**	**Area** (km^2)	**Population estimate**	
			adults	*packs*
Populations resident across international boundaries				
Okavango/Khaudom/ Hwange/Mucussa/Sioma Ngwezi	Botswana/Namibia/Zimbabwe/ Angola/Zambia	424,068	2,472†	295†
Selous/Niassa/Quirimbas	Tanzania/Mozambique	153,328	1,272†	98†
Kruger/SE Zimbabwe	South Africa/Zimbabwe	41,599	350†	38†
Kajiado/Loliondo	Kenya/Tanzania	29,089	100†	8†
Lower Zambezi/Mana Pools	Zambia/Zimbabwe	17,725	50†	4†
Niokola-Koba/Badiar	Senegal/Guinea	25,000	50†	4†
Pendjari/Arli/W	Benin/Niger/Burkina Faso	24,746	50†	4†
Faro/Benoué/Gashaka Gumti	Cameroon/Nigeria	31,650	50†	7†
Bamingui-Bangoran	CAR/Chad	32,000	50†	4†
	Sub-total:	***779,205 (69.3%)***	***4,444 (57.8%)***	***462 (62.3%)***
Populations connected across international boundaries				
Kafue	Zambia/Zimbabwe/Botswana	23,154	230*	19*
Boma	Sudan/Ethiopia	19,295	193*	16*
Ijara-Lamu	Kenya/Somalia	13,031	130*	11*
Dinder	Sudan/Ethiopia	7,775	78*	6*
Radom	Sudan/CAR	6,139	61*	5*
Omo/Mago	Ethiopia/Sudan	13,783	40†	4†
Liuwa Plains	Zambia/Angola	2,891	24†	2†
Kasungu	Malawi/Zambia	2,110	14†	2†
	Sub-total:	***88,178 (7.8%)***	***770 (10.0%)***	***65 (8.8%)***
Populations not connected across international boundaries				
Rungwa-Ruaha	Tanzania	27,286	500†	35†
Kigosi/Moyowosi	Tanzania	23,290	400†	33*
Samburu-Laikipia	Kenya	13,885	282†	26†
Katavi	Tanzania	39,097	200†	17*
Southern	Sudan	12,973	130*	11*
Tsavo	Kenya	24,431	100†	12†
South Luangwa	Zambia	21,051	100†	8*
Savé Valley	Zimbabwe	3,200	85†	9†
Bandingilo	Sudan	7,482	75*	6*
Cacolo/Saurimo	Angola	8,183	75†	6†
Filtu	Ethiopia	7,136	71*	6*

			Population estimate	
Maasai Steppe	Tanzania	18,995	70†	8†
Bubye/Bubiana	Zimbabwe	6,422	60†	4†
Hluhluwe-iMfolozi	South Africa	989	41†	6†
Marromeu	Mozambique	6,280	41†	3†
Harenna	Ethiopia	5,874	40†	2†
North Luangwa	Zambia	4,037	40*	3*
Isiolo	Kenya	3,552	30†	2†
Machakos	Kenya	1,062	25†	2†
Kora-Nkitui	Kenya	2,008	20†	2†
Matusadona	Zimbabwe	1,326	18†	3†
Arba Minch	Ethiopia	1,598	16*	1*
Greater Waterberg	South Africa	15,752	15†	3†
Madikwe	South Africa	599	15†	2†
Pilanesberg	South Africa	407	7†	1†
Thanda	South Africa	23	7†	1†
Mkhuze	South Africa	241	6†	1†
Venetia	South Africa	313	5†	1†
Tswalu	South Africa	246	3†	1†
	Sub-total:	***257,738***	***2,477***	***215***
		(22.9%)	***(32.2%)***	***(29.0%)***
	Grand total:	**1,125,121**	**7,691**	**742**

†population sizes estimated by workshop participants using a variety of methodologies; *population sizes estimated from the size of the polygon using a conservative density of 1 adult per 100km^2 and 12 adults (including yearlings) per pack.

larger predators such as lions (*Panthera leo*) and hyaenas (*Crocuta crocuta*) kill wild dogs and steal their kills and, probably as a consequence, wild dogs avoid areas of high prey density where such competitors are abundant (Creel & Creel, 1996; Mills & Gorman, 1997). Hence, wild dogs are one of very few carnivore species that live at lower densities, and range more widely, in areas of high prey density (Woodroffe & Ginsberg, 2005). Population densities are low in all cases, averaging about 0.02 (range 0.007-0.04) adults and yearlings per km^2. Viable populations therefore require extremely large areas to persist (e.g. 200 wild dogs living at average density would occupy 10,000km^2).

Wild dogs do not show cyclical seasonal migrations comparable with those exhibited by some bird and antelope species. However their distribution, and their wide-ranging behaviour, does mean that individual animals regularly cross jurisdictional boundaries. Particularly importantly, a high proportion of the world's wild dog populations are dependant upon landscapes which span international borders (Table 1).

Wild dogs' very large area requirements mean that international cooperation is vital for long-term conservation planning. Table 1 shows that around 60% of the world's wild dogs occur in populations known to traverse international borders, with nearly 70% of resident wild dog range spanning such boundaries. These figures are further enlarged if populations are included which are linked either by land that is suspected to support resident animals (probable range in Figure 1), or by corridors of unoccupied habitat which facilitate movement by dispersing animals (connecting range in Figure 1), with nearly 70% of the world's wild dog population, and nearly 80% of wild dog range, potentially traversing international borders (Table 1).

Given the very high proportion of the world's remaining wild dog populations that span international borders, the Kenya Wildlife Service seeks to place the entire species on Appendix II of the CMS. This is consistent with the aims of recently-developed strategic plans for wild dog conservation in eastern and southern Africa, which include plans to "*Propose and support proposals for... wild dogs to be listed within the Convention on Migratory Species*" (IUCN/SSC, in press) and to achieve "*a regional agreement to collaborate in conserving... wild dogs across southern Africa...*" (IUCN/SSC, in prep). Listing of wild dogs on CMS would provide a framework within which Memoranda of Understanding could be established between range states for critically important transboundary conservation efforts. No such framework is currently available; any other international treaties do not protect the species.

3. Threat data

3.1. Direct threats to the populations

The principal direct threats to wild dog populations are conflict with human activities, and infectious disease. Both of these are mediated, however, by habitat fragmentation, which increases contact between wild dogs and livestock (which encourages depredation and hence conflict), and between wild dogs and domestic dogs (which facilitates disease transmission).

Deliberate and accidental killing by people are major causes of mortality for wild dogs, even when they spend most of their time in nominally protected areas. Packs' wide ranging behaviour, perhaps combined with an affinity for areas of reduced prey density (Creel & Creel, 1996; Mills & Gorman, 1997), means that even those living in reserves are intermittently exposed to human activities on or beyond reserve boundaries (Woodroffe & Ginsberg, 1998). In human dominated landscapes, wild dogs are shot by farmers who perceive them to be a threat to livestock, and by game ranchers who consider them competitors for potentially valuable managed ungulates. In addition, they are killed accidentally in road traffic accidents and, perhaps most seriously, captured accidentally in snares set by bushmeat hunters (Woodroffe *et al.*, 2007a). Such impacts can occur over long distances: wild dogs radio-collared inside Hwange National Park in Zimbabwe were regularly killed in road traffic accidents on a road some 40km from the park boundary (J.R. Ginsberg unpublished data). Meta-analyses indicate that this human-caused mortality acts in addition to natural mortality, and hence has the capacity to cause population decline (Woodroffe *et al.*, 2007a). Indeed, comparative analyses suggest that human activities on reserve borders generate 'edge effects' sufficient to drive wide ranging carnivores to local extinction (Woodroffe & Ginsberg, 1998).

Infectious disease is a highly episodic threat. Rabies, in particular, has contributed to the extinction of one protected population (which formerly inhabited the transboundary Serengeti ecosystem) and has thwarted two reintroduction attempts (Gascoyne *et al.*, 1993; Kat *et al.*, 1995; Scheepers & Venzke, 1995; Hofmeyr *et al.*, 2000). Both domestic dogs and other species of wild carnivore are implicated in transmitting disease to wild dogs. Conservationists are ill-equipped to manage this threat, partly because of its biological complexity, and partly because of past controversies surrounding attempts to intervene (Woodroffe, 2001).

3.2. Habitat destruction

Destruction and modification of African wild dogs' habitat is the principle threat to the species' long term persistence. While the species' habitat requirements are not highly specific, because they live at such low population densities, and range so widely, wild dogs are acutely sensitive to even quite low levels of habitat fragmentation. For example, given an average population density of 0.02/km^2, a reserve of 5,000km^2 – very large by most standards – could be expected to contain just 100 wild dogs, far smaller than the minimum required to maintain long-term viability according to most rules-of-thumb (Soulé, 1987). Moreover, simple geometry dictates that a reserve of 5,000km² contains no point more than 40km from its borders – a distance well within the range of distances travelled by a pack of wild dogs in their usual ranging behaviour. Hence, the entire population inhabiting such a reserve could be exposed to threats associated with human activities on reserve borders. Indeed, empirical data show that over half of the populations that formerly inhabited reserves of 3,600km^2 have already become extinct, with reserves well in excess of 10,000km^2 needed to secure persistence thus far (Woodroffe & Ginsberg, 1998).

Given this extreme sensitivity to habitat fragmentation, the maintenance (and, where possible, expansion) of very large, well-connected wildlife areas has been recognised as the highest priority for wild dog conservation (Woodroffe, Ginsberg & Macdonald, 1997; Woodroffe & Ginsberg, 1999; Woodroffe *et al.*, 2004; Woodroffe *et al.*, 2005a). Many such areas span international borders; hence international collaboration will be required to achieve this goal. Listing of the species on the CMS would provide a framework for such transboundary cooperation.

3.3. Indirect threats

Indirect threats to wild dogs may be considered to take two forms. First, the species faces several indirect threats associated with human activities. At the broadest level, growth of the human population, with associated encroachment into wildlife habitat and intensification of human land uses, contribute to habitat loss, conflict, accidental killing and disease transmission (see section 3.1 above). At the same time, there is limited appreciation of the species' ecological importance and endangered status, so that it has hitherto received little attention from conservation professionals. Range state wildlife authorities' capacity to conserve the species is very limited, particularly as experience from better known species (such as African elephants and rhinos) often cannot be applied to wild dogs which face very different direct threats.

In addition to these indirect anthropogenic threats, some authors have considered larger wild predators to represent threats to wild dog populations. This is because interactions with species such as lions and spotted hyaenas probably underlie the species' low population densities and dangerously wide ranging behaviour (Creel & Creel, 2002). However, guilds of African predators evolved together, and coexisted until encroachment of human activities fragmented their habitat and exposed them to bullets, snares, poison and high speed vehicles. While there is very convincing evidence that predation, and antipredator behaviour, influence wild dogs' endangered status, it is probably not constructive to view larger predators as threats – particularly as 'big cats' are a mainstay of Africa's ecotourism industry.

3.4. Threats connected especially with migrations

Most of the remaining wild dog populations that are large enough to be potentially viable span international boundaries. Given the relatively small absolute size of these populations (especially given the small proportion of individuals contributing to reproduction; see above), extirpation of the animals on one side of an international boundary would in many cases leave the remaining population too small to be viable. In addition, degradation of habitat on one side of an international border (e.g. through conversion to cultivation or fenced game farms, or construction of large high-speed roads) would create inhospitable areas likely to have negative impacts on wild dogs moving regularly from the other side of the border. Hence, the conservation of most of the world's remaining wild dogs depends critically upon international cooperation to avoid further fragmentation of wildlife-friendly habitat.

3.5. National and international utilization

Consumptive utilization of wild dogs is rare, occurring only in a few localised areas (e.g. in parts of Zimbabwe, Davies & Du Toit, 2004). Direct killing by people is arguably the most serious direct threat to wild dogs throughout their range; however this occurs either accidentally (e.g. snaring, road accidents) or as a result of conflict with livestock and game farmers.

4. Protection needs and status

4.1. National protection status

African wild dogs are legally protected in most of the range states where they still occur (Table 2). However, as wild dogs tend to inhabit remote areas with limited infrastructure, this protection is very rarely enforced. Even total legal protection, which is in place in several countries, has not prevented national extinctions (e.g. in Congo, Rwanda).

***Table 2** – Protection status of wild dogs in range states and former range states, updated from Woodroffe et al. (2004)*

Country	Status of wild dogs	Date	Degree of protection	Date of legislation
Angola	present	1987	total?	1957
Benin	present	1987	?	–
Botswana	present	1996	partial	1979
Burkina Faso	present	1987	partial	1989
Cameroon	present	1992	partial?	?
Central African Republic	present	1987	total	1984
Chad	present	1987	?	–
Congo	extinct	1992	total	1984
Côte d'Ivoire	extinct	1987	noxious	1965
Democratic Republic of Congo	extinct	1987	partial	1982
Eritrea	extinct	1992	?	–
Ethiopia	present	1995	total	1972
Gabon	extinct	1987	?	–
Ghana	extinct	1987	partial	1971
Guinea	present*	1996	total	1990

Country	Status of wild dogs	Date	Degree of protection	Date of legislation
Kenya	present	1996	partial	1976
Malawi	present*	1991	partial	?
Mali	extinct	1989	?	–
Mozambique	present	1996	total	1978
Namibia	present	1996	total	?
Niger	present	1987	total?	?
Nigeria	present*	1991	total	1985
Rwanda	extinct	1987	total	1974
Sénégal	present	1996	partial	1986
Sierra Leone	extinct	1996	?	–
Somalia	unknown	1994	total	1969
South Africa	present	1996	specially protected	?
Sudan	present	1995	total?	?
Swaziland	extinct	1992	?	–
Tanzania	present	1996	total	1974
Togo	extinct	1987	partial	1968
Uganda	extinct	1996	?	–
Zambia	present	1994	total	1970
Zimbabwe	present	1992	partial	1990

*tiny population sustained by connection with neighbouring country

4.2. International protection status

Wild dogs are not formally protected by any international conventions or treaties. They are recognised as ‘endangered’ by the World Conservation Union (IUCN, 2006), as well as under the U.S. Endangered Species Act.

4.3. Additional protection needs

There can be no doubt that the most effective way to conserve wild dogs is to encourage land uses that allow the maintenance and, where possible, restoration of extensive well-connected wildlife areas. Only very large areas can support populations large and extensive enough to be viable in the face of chronic human-caused mortality and occasional outbreaks of infectious disease (Woodroffe, 1999). Such management need not entail total legal protection of either the land or the wild dogs; studies have shown that, under the right circumstances, wild dogs can coexist successfully with both livestock farmers (Woodroffe *et al.*, 2005b; Woodroffe *et al.*, 2007b) and game ranchers (Pole *et al.*, 2004). Indeed, the reduced densities of competing predators that typically occur in multiple-use landscapes may even make such areas better habitat for wild dogs than are fully protected reserves.

Tools have been developed to address most of the threats known to face wild dog populations (Woodroffe *et al.*, 2005a), but these need to be extended and applied to new areas. While some of these tools can be implemented by wildlife managers and conservation NGOs, others require intervention at the national and international level to influence land use policy.

Accidental snaring can be effectively controlled by antipoaching patrols (Woodroffe *et al.*, 2005a). Working with local communities to identify alternative sources of protein may also be highly effective (Lewis & Phiri, 1998).

Conflict with livestock farmers is very effectively reduced where wild prey are conserved, and where traditional husbandry measures are practiced (Woodroffe *et al.*, 2005b; Woodroffe *et al.*, 2006). Diversification of incomes to reduce both dependence on livestock, and livestock densities, may help to reduce the conflicts; development of ecotourism and safari hunting are two ways to encourage this.

Conflicts with game farmers are more difficult to resolve, because very few measures can effectively dissuade wild dogs from killing their natural prey. However, surveys of rancher attitudes suggest that willingness to tolerate wild dogs (and other predators) is far lower on small game farms isolated from their neighbours by game fencing, than in 'conservancies' where internal fencing has been removed so that wildlife can move freely across property boundaries (Lindsey, du Toit & Mills, 2005). The rapid spread of game ranching as a land use, especially in southern Africa, represents both a huge opportunity and a huge challenge for wild dog conservation; while it may restore thousands of square kilometres of potential habitat, it may also undermine the viability of existing populations by attracting wild dogs to hostile 'sink' habitat where rancher intolerance makes it impossible for them to persist. Under these circumstances, government incentives to encourage the formation of conservancies could be a powerful tool for wild dog conservation.

Infectious disease is a still more intractable threat to wild dogs. Vaccination of domestic dogs may help to reduce the risks of infection spilling over into wild dogs, but this would need to be carried out, in perpetuity, over vast areas to be effective. Moreover, experience with Ethiopian wolves suggests that success is not assured even where good vaccination cover is maintained over several years (Randall *et al.*, 2004; Haydon *et al.*, 2006). Once again, maintaining large, well-connected populations that can persist in the face of occasional disease outbreaks is probably the most sustainable solution.

Road accidents are a serious threat to wild dogs in some areas, partly due to the species' tendency to use roads both for travelling and for resting. While measures such as road signs and speed bumps may help to reduce losses locally, the most effective long term measure would be to avoid routing new roads through or close to key wildlife areas, and to minimise road improvements in such areas. Once again, this requires action at the national policy level.

Since most remaining wild dogs live in populations, which traverse international boundaries, all of these conservation measures will be most effective if they are planned as partnerships between neighbouring countries. Indeed, as discussed above, given the high proportion of the world's wild dogs that inhabit populations spanning international boundaries, such transboundary collaboration will be absolutely critical for effective conservation management. The need to encourage transboundary management has been highlighted in recently-developed strategic plans for wild dog conservation in eastern and southern Africa (IUCN/SSC, in prep; IUCN/SSC, in press). At present, there is no clear framework within which such transboundary partnerships can be established. The Convention on the Conservation of Migratory Species provides just such a framework, offering opportunities for the development of Memoranda of Understanding between range states to effectively conserve this extremely wide-ranging species on the very large spatial scale that it requires.

5. Range states[1]

States known or strongly suspected to support resident populations of African wild dogs are ANGOLA, BENIN, BURKINA FASO, Botswana, CAMEROON, Central African Republic, CHAD, CÔTE D'IVOIRE, Ethiopia, KENYA, Mozambique, Namibia, NIGER, SENEGAL, SOUTH AFRICA, Sudan, TANZANIA, Zambia, and Zimbabwe (Fanshawe *et al.*, 1997; Woodroffe *et al.*, 2004; IUCN/SSC, in prep; IUCN/SSC, in press). Tiny populations are also resident in GUINEA, Malawi and NIGERIA although their viability appears to be almost entirely dependent on connections to neighbouring countries (SENEGAL, Zambia and CAMEROON respectively). Wild dogs are known, or presumed to be, extinct, or near-extinct, in Burundi, DEMOCRATIC REPUBLIC OF CONGO, ERITREA, GABON, GAMBIA, GHANA, GUINEA-BISSAU, Lesotho, MALI, RWANDA, Sierra Leone, Swaziland, TOGO and UGANDA (Fanshawe *et al.*, 1997; Woodroffe *et al.*, 2004; IUCN/SSC, in prep; IUCN/SSC, in press). The situation in SOMALIA is unknown, but it is possible that packs still occur there.

6. Comments from Range States

7. Additional remarks

This proposal is consistent with the aims of strategic plans for wild dog conservation in eastern and southern Africa formulated recently by participants including representatives of range state wildlife authorities, and facilitated in part by the IUCN/SSC Canid Specialist Group (IUCN/SSC, in prep; IUCN/SSC, in press). These strategies are components of a range wide conservation planning process which has highlighted the need to conserve wild dogs at a very large spatial scale. Achieving the strategies' goals will require transboundary collaboration, and the Convention on the Conservation of Migratory Species offers a very promising means to achieve this end.

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[1] CMS Parties in capitals.

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

A. PROPOSAL: Inclusion of the Saiga Antelope (*Saiga tatarica*) on Appendix II

B. PROPONENT: Government of Mongolia

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Artiodactyla
1.3	**Familia**	Bovidae
1.4	**Genus or Species**	*Saiga tatarica* (Linnaeus, 1766)
1.5	**Common name(s)**	English: Saiga French: Saïga Spanish: Antílope saiga; Saiga Italian: Antilope delle steppe Russian: Saigak

2. Biological data

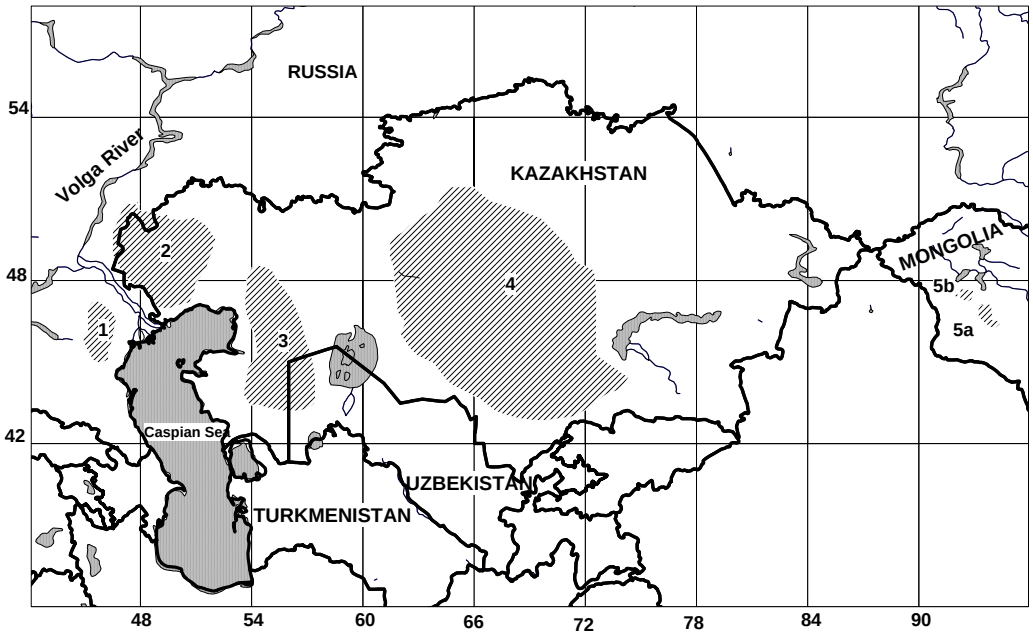
2.1. Distribution

Currently there are four isolated populations of the subspecies *Saiga tatarica tatarica*, three in Kazakhstan, the Ural, Ust'-Urt and Betpak-dala, and one in Kalmykia, Russia; there are also two small populations of *Saiga t. mongolica* in Mongolia. Up to the early sixties there was a population of *Saiga tatarica tatarica* also in Mongolia.

In the Quaternary Period the Saiga antelope occupied an area far more extensive than its present range. The animal's bones have been found in Ice Age deposits scattered from the British Isles to Alaska and the Northwest Territories of Canada, all the way to the New Siberian Islands in the north and the Caucasus region in the south (Sokolov & Zhirnov, 1998). Up through the 17th and 18th centuries A.D., the animal still had a broad range in Europe, reaching as far as the Carpathian foothills in the west and the environs of Kiev in the north (Sokolov & Zhirnov, 1998). By the late 19th century, however, the blitzkrieg of agricultural development nearly wiped it from the face of the continent, leaving but a few sparse flocks on the plains along the northwestern shore of the Caspian Sea. In the middle of the 19th century, although already gone from the plains west of the Don, the species was still quite plentiful in the Kalmyk steppes.

Figure 1. Current range of the Saiga antelope, showing the approximate range area of each of the populations, together with country borders and latitude and longitude. 1. Kalmykia, 2. Ural, 3. Ustiurt, 4. Betpak-dala (all *Saiga tatarica tatarica*), 5 - Mongolia (*Saiga tatarica*

mongolica, 5a - Shargyn Gobi population, 5b - Mankhan population) (From Milner-Gulland *et al*., 2001).



2.2 Population

The total population has shown an observed decline of over 80 % over the last 10 years, and decline is continuing. Severely skewed sex ration are leading to reproductive collapse. It is classified as Critically Endangered using IUCN red list criteria (CR A2a, IUCN 2004).

The global population is now c.50,000, down from 1,250,000 in the mid-1970s. Most are found in Kazakhstan (decline from 1,000,000 to 30,000).

Between 1980 and 1994, the total numbers of Saiga antelope fluctuated around 670,000 - 1,251,000 animals. The Kalmykian population ranged between 142,000 to 430,000; the Ural population between 40,000 to 298,000; the Ust'-Urt population between 140,000 to 265,000; the Betpak-Dala between 250,000 to 510,000 and the Mongolian population between 300 to 1600 individuals. All four populations of *S. t. tatarica* show dramatic population declines from 1998 onwards. Annual decline rate for the total *S.t. tatarica* population in 1998-1999 was about 35 % (63 % for Kalmykia, 19% for the Ural, 19 % for the Ust'-Urt and 47 % for the Betpak-dala population). In 1999-2000 the rate of decline increased to 56 % (53%, 79%, 42%, 77% and 56 % respectively). The Betpak-dala population has suffered particularly heavy declines, with the current population numbers barely reaching 4% of the 1980-90 population estimates. The Ural and Kalmykia populations have similar status, with populations currently at 15-20% of their 1980s level, with steep declines between 1998 and 2001. For example, an aerial survey in May 2001 yielded an estimate of only 17,800 Saigas in Kalmykia, indicating that the population is continuing to decline. The Ust'-Urt population is also declining rapidly.

The Mongolian sub-species is in a perilous state because of its small population size, but there is no clear evidence for a steady decline. Number fluctuation of the Mongolian Saiga is clearly observable with comparison of previous survey reports. It is determined that there were about 700 Saigas in Shargiin Gobi in 1976 after reviewing all survey reports done since 1960s. After this, the Saiga numbers were 300 in 1978 (Sokolov *et al*.), 600-750 in 1981 (Lushekina *et al*., 1997), 750-1,600 in the period of 1982-1989 on the basis of annual counting (Dulamtseren, 1992) and 1,400 by 1993 counting (Dulamtseren and Tulgat, 1993). Mongolian-German joint researchers estimated over 1,600 Saigas in Shargiin Gobi in 1994, but in August 1997, a Mongolian-Russian biological expedition reported that the population had decreased in to 860 individuals. The Khuisiin Gobi population was later estimated by Amgalan (1994) and by Lushekina *et al.* (1997) at around 200 Saiga. The Mankhan population had over 130 Saiga in 1982. But due to harsh winter in 1983-1984 less than 30 survived, but it went up to 70 individuals in 1993. It again decreased to 44-48 in 1998 (Badrakh 1993, Shar 1998).

According to the census in December 2000, the number of Mongolian Saiga in Shargiin Gobi, Khuisiin Gobi, Durgun steppe, in an area of about 13,375 km^2, has increased up to 5200 individuals. The number had almost doubled from the estimation made in 1998. The population assessment carried out in winter of 2003 suggests that approximately 750 Mongolian Saigas remain in Mongolia (Amgalan 2004). The survey carried out in March 2005 showed that about 1050 individuals inhabit the Shargiin Gobi and Khuisiin Gobi. The last survey carried out in January 2008 showed that about 3200 saiga inhabit Mongolia (Lhagvasuren et al., 2008) and summer calf study held in May-June, 2008 showed that the birth rate is high and percentage of twins is about 70% comparing to 25% in late 1980s.

2.3 Habitat

The main habitats of the Saiga antelope are the plains in dry steppe and semi-desert natural zones of Kazakhstan and Kalmykia. It avoids any areas with dense bushes and thickets along water bodies, but could use them as a shelter during severe winters particularly in days with strong wind. During the dry season Saiga can visit irrigated crop fields for feeding.

2.4 Migrations

Both intra-seasonal and inter-seasonal migrations are observed. Inter-seasonal migrations are somewhat regular and take place in spring and autumn, usually with a north-south direction. The length of those migrations depends on the weather and foraging conditions of the year. Normally, the length of these inter-seasonal migrations is about 150 to 300 km for the Kalmykian population, in the order of 600 to1200 km for Betpak-dala population, of 300 to 600 km for the Ust'-Urt population, and from 200 to 300 km for the Ural population. During such movements, Saiga can reach the northern and the north-western part of Turkmenistan.

3. Threat data

3.1 Direct threat

All the Saiga populations have suffered from heavy poaching, habitat degradation and disturbance. Droughts or severe winters, diseases and predation pressure from wolves can also act as factors of threat of Saiga populations (Bekenov *et al*., 1998), however these are not

major causes of declines. There is no evidence of mass mortality from disease in any population. Kalmykia has had to suffer from serious drought in the last few years, which may have been a contributing factor. However, climate conditions in Kazakhstan have been favourable for Saiga since 1994. The most likely explanation of the dramatic recent declines is severe poaching pressure. As only males bear horns, poaching has led to a dramatic drop in the proportion of adult males in the population.

3.2. Habitat destruction

Extensive and increasing occupation by livestock, overgrazing and consequent destruction of preferred habitats, competition for water sources, construction of roads and canals, or more generally habitat destruction is an important cause of decline of the Saiga. Before 1991, livestock numbers, mostly sheep, increased enormously, and the rangelands, particularly in Kalmykia, formerly grazed only in winter, were used intensively throughout the year. Saigas are being pushed off into less preferred and unsuitable habitats. Large areas of rangeland have been lost to cultivation and short-term irrigation projects. In many cases former areas of good quality steppe and semi-desert rangeland were replaced by tracts of sand and saline marshes. In Kalmykia, between 1953 and 1959, areas of blown sand represented no more than 2-3% of the land, but by 1985 they covered 33%. This desertification process is continuing. The impacts of irrigation canals, highways and wire fences (for protection of so-called "cultural pastures") on Saiga populations are serious. These obstacles have interrupted Saiga migration routes and sometimes lead directly to increased mortality. There is evidence that Saiga populations in some regions have become sedentary or semi-sedentary and the lack of good seasonal pastures, along with the effects of increased disturbance, have lowered fecundity and increased mortality. Notwithstanding the preceding description of the Saiga's decline relative to habitat, the careful evaluation and analysis of the impact of different factors on the habitat’s degradation in different parts of the Saiga's range up to now has not been examined systematically and should be considered a priority area for future actions directed to Saiga conservation at national and regional levels.

3.3 Indirect threat

Indirect threats include fragmentation of range due to agriculture development, irrigation, construction of roads, highways and canals.

3.4 Threats connected especially with migrations

During long distance migrations Saigas appeared at territories where it is difficult to organize their protection. Data show that when Saiga herds from Kalmykia migrated in winter into Daghestan (North Caucasus), they were heavily poached. The same observations are applicable for migrating Saiga across frontiers between Kazakhstan and Uzbekistan and Turkmenistan. In Mongolia, water points and grazing areas used by Saigas during migration are now mostly occupied by human and livestock.

There is an ongoing migration study with satellite telemetry on Saiga in Mongolia since 2006 and the results showed that some migration bottleneck can affect the Saiga movement to better pastures.

3.5 National and international utilization

National use: Saiga is used for meat consumption. The recent social and economic changes increased its impact. A serious decline in livestock numbers beginning from 1992 has certainly increased the interest in Saiga as a source of meat. Indeed, its meat can now be bought on food markets even in the capital of Kalmykia as well as in different parts of Kazakhstan (Lundervold, 2001; Pereladova & Lushchekina, 2001).

International use. Saigas are hunted for their horns. An increasing impact of horn hunting was already observed in the last years of the Soviet Union's existence, when the state monopoly on international trade was dissolved and the customs regulations became lax, stimulating a massive illegal hunt for Saiga horns and their subsequent exportation to the Oriental markets, to be used for medicinal purposes. By the turn of the 1990s, one kilogram of Saiga horns (~4 pairs) could be sold in Kalmykia for US $30. Because this is a great deal of money by local standards, the amount of poaching in those years is believed to have reached no less than 15,000 to 20,000 animals a year (Sokolov & Zhirnov, 1998). In parallel, the proportion of adult males declined steadily from 1997, which shows that poaching for horns grew more intense as well. Female Saiga is hornless. Saiga horns prices in Kalmykia have by now reached as much as US $100 per kilo, making it very attractive for the impoverished population of the pastoral regions.

In Mongolia, Saiga males are hunted mostly for their horns. Poachers sell the horns to buyers from towns and big cities who in turns sell them to Chinese. It is reported that Saiga horns are used in Chinese medicine in association with other products to make so called "helpful" drugs. Saiga meat is not in favour among Mongolians.

4. Protection status and needs

4.1. National protection status

In Kazakhstan, Russia, Uzbekistan, Turkmenistan, up to now *Saiga tatarica tatarica* is protected as a common hunting animal: regulation for opening hunting seasons and introduction of hunting bans when there are some data on low numbers of Saiga population. It was applied for many years before the 1950s last century and repeated again recently in Kalmykia and Kazakhstan (1998).

In Mongolia, Saiga is listed in several legislative documents:

- Resolution 83 of the MP on Protected Areas as of 1993.01.12
- Law on Special Protected Areas as of 1994.11.15
- Law on Environmental Protection, 03.30.30
- The Hunting Law, 1995.04.10
- Law on hunting fees, 1995.05.22

Personal and commercial hunting is not allowed under the Law as of 1930. The Saiga is listed as a very rare animal in Mongolian Red Data Book (1987, 1997) and in the reviewed version of the Hunting Law, 1995.

4.2. International protection status

International concern about the plight of the Saiga antelope was first raised in 1995 (Chan *et al*., 1995; New Scientist, 1995). Nowadays, the total population has shown an observed decline of over 80 % over the last 10 years, and decline is continuing. Severely skewed sex ration are leading to reproductive collapse. It is classified as critically endangered (CR A2a) using IUCN red list criteria's (2004).

Heightened international awareness about the plight of the Saiga led to a CITES Appendix II listing in 1995; proposals to list the Mongolian subspecies on Appendix I were rejected because of difficulties in distinguishing horns from this subspecies in trade. Since Kazakhstan's accession in 2000, all the Saiga range states are now CITES parties.

4.3 Additional protection needs

Legislation protecting Saiga exists at national level but increased enforcement, and especially external funding for anti-poaching measures and linked rural development are urgently needed. Presently the key requirement is funding of national conservation actions, rather than improving the international trade control.

Special protected areas for lambing/rutting places should be established in all territories inhabited by Saiga populations.

In Mongolia it is important to regulate pasture and water sources so they are available for Saiga. Another important measure is the provision of additional food during the harsh winter and clearing out of water sources occupied by human and livestock during droughts, and most importantly funding is needed for local rangers to regularly maintain patrolling around Saiga area especially in critical seasons like birth giving and rut.

5. Range States[1]

KAZAKHSTAN, MONGOLIA, Russian Federation, Turkmenistan, UZBEKISTAN; recently extinct in China and UKRAINE.

6. Comments from Range States

7. Additional remarks

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Appendix

Table 1. Population estimates for the Saiga antelope. The total estimated Saiga population size (rounded to the nearest thousand animals) is given for those years in which all four populations of the nominate subspecies were surveyed. Numbers in bold are dubious as they are extrapolated from counts of 50% of the range area (estimate = 2x actual count), and those in italics are the product of vehicle surveys. Vehicle surveys are not easily comparable to aerial surveys, and are much more prone to error and bias (and particularly to underestimating population size). All other values are total counts from aerial surveys, hence confidence intervals are not given. Data up to 1997 for Kazakhstan are from Bekenov *et al*. (1998) and for Mongolia from Lushchekina *et al*. (1999). Kalmykian data up to 1994 are from Sokolov *et al*. (1998). Data after these dates are from surveys carried out by the following organisations: Kalmykia - the Department for Conservation, Control and Management of Game Animals, the Central Laboratory for Hunting Management and the former Saiga Research Centre; Kazakhstan - the Institute of Zoology of the Kazakhstan Ministry of Education and Science; Mongolia - WWF-Mongolia and the Institute of Ecology and Evolution, Moscow, Russia, and are reproduced with permission. (From Millner-Gulland *et al*.,2001).

)	**Populations**					**Total**
Year	**Kalmykia**	**Ural**	**Ust'-Urt**	**Betpak-dala**	**Mongolia**	
1980	380,000	120,000	170,000	400,000	-	1,070,000
1981	430,000	160,000	190,000	470,000	*750*	1,251,000
1982	385,000	180,000	190,000	480,000	*925*	1,236,000
1983	280,000	150,000	180,000	440,000	-	1,050,000
1984	265,000	40,000	190,000	340,000	*125*	835,000
1985	222,000	50,000	190,000	400,000	-	862,000
1986	200,000	70,000	150,000	250,000	-	670,000
1987	143,000	100,000	140,000	300,000	-	683,000
1988	157,000	90,000	207,000	368,000	*1700*	824,000
1989	150,000	135,000	265,000	323,000	-	873,000
1990	160,000	138,000	202,000	361,000	-	861,000
1991	168,000	236,000	232,000	357,000	-	993,000
1992	152,000	298,000	254,000	375,000	-	1,079,000
1993	148,000	250,000	216,000	510,000	*300*	1,124,000
1994	142,000	274,000	254,000	282,000	*300*	952,000
1995	220,000	-	-	212,000	*1300*	-
1996	196,000	-	**214,000**	248,000	-	-
1997	*259,000*	-	-	-	*1300*	-
1998	150,000	*104,000*	246,000	**120,000**	-	620,000
1999	55,000	84,000	**200,000**	***64,000***	-	403,000
2000	26,000	17,500	116,000	*15,000*	*3000*	178,000

Table 2 Rates of decline of populations of *Saiga tatarica tatarica*. The mean population size in 1980-90 is calculated from Table 1, and the 1998-2000 population estimates are given as a proportion of this. The rate of decline for 1998-1999 and 1999-2000 is also shown. The 1980-90 mean population size for Kalmykia is multiplied by 0.58 to correct for the difference in time of year between the two sets of surveys. (From Millner-Gulland *et al*.,2001)

	Kalmykia	**Ural**	**Ust'-Urt**	**Betpak-dala**	**Total**
Mean 1980-90	146,200	112,000	188,500	375,600	823,300
Pop size as a proportion of 1980-90 mean					
1998	1.03	0.93	1.30	0.32	0.67
1999	0.38	0.75	1.06	0.17	0.43
2000	0.18	0.16	0.62	0.04	0.19
Annual decline rate					
1998-1999	63%	19%	19%	47%	35%
1999-2000	53%	79%	42%	77%	56%

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

A. PROPOSAL: Listing the entire population of *Oxyura maccoa* on Appendix II

B. PROPONENT: Government of Kenya

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Aves
1.2	**Ordo**	Anseriformes
1.3	**Familia**	Anatidae
1.4	**Species**	*Oxyura maccoa*
1.5	**Common name(s)**	English: Maccoa Duck French: Érismature maccoa

2. Biological data

2.1 Distribution

Predominantly Afrotropical duck species of inland wetlands. Found in Ethiopian highlands, eastern and southern Africa regions.

2.2 Population

Considerable differences exist on reports in abundance and distribution in East Africa. In East Africa the population is estimated at 1000-1500, Ethiopia, 500-3000, Southern Africa <10000. Generally numbers are decreasing within its range, and in Kenya, the species is listed as rare with a population estimate of about 700.

2.3 Habitat

Resident on alkaline and freshwater lakes, shallow waters and swamps with fringing vegetation. Are bottom feeders where they dive to sift the bottom mud for small invertebrates, plant debris and seeds. Males are territorial during the breeding seasons. In Kenya, it is uncommon in its preferred habitats in the Rift Valley and central highlands, and ranges mainly above 1500 m above sea level.

2.4 Migrations

Mainly sedentary with small-scale dispersive movements in eastern and southern Africa. In most cases migrations are seasonal subject to the availability of suitable habitats during dry seasons. In Kenya, it migrates regularly within its range, but there are no adequate details about movements.

3. Threat data

3.1 Direct threat

Drowning in fishing nets on lakes is common for this species. Habitat changes such as drainage and discharge of wastes also directly affect this species. Illegal and recreational hunting has been reported in some areas within its range. Diseases associated with the direct pollution to the wetland ecosystems could be affecting the species, but this has not been extensively investigated.

3.2 Habitat destruction

Degradation of wetlands through from sewage, industrial effluents and agricultural runoffs that find their ways to the wetlands. Loss of catchments due to degradations affect the hydrology and water volumes for the major lakes where the species is found in Kenya.

3.3 Indirect threat

Though not documented in Kenya, competition with other duck species could be happening. Nest predations by other wetland species could also be affecting its breeding performance.

3.4 Threats connected especially with migrations

The continued encroachment, drainage of particular wetlands and invasive species in areas where it inhabits. Incoherent legislations governing species conservation and land use around the preferred habitats for the species.

3.5 National and international utilisation

No direct utilization known in Kenya, but the species is perhaps utilized elsewhere within the range.

4. Protection status and needs

4.1 National protection status

Like all other wildlife species in Kenya, the species is protected under Wildlife Act but has no special protection at present.

4.2 International protection status

The species is listed as vulnerable (VU A1b,d; A2b,d; C1; C2b (BirdLife International)). But not listed in Appendices I or II of CMS. In eastern Africa, the species is listed as regionally threatened.

4.3 Additional protection needs

Enforcement of protection of the staging wetlands for the species in the Afrotropical region is necessary. Development of species action plan would further enhance its conservation.

5. Range States[1]

ANGOLA, Botswana, Burundi, DEMOCRATID REPUBLIC OF CONGO (Zaire), Ethiopia, ERITREA, KENYA, Lesotho, Malawi, Mozambique, Namibia, RWANDA, SOUTH AFRICA, Sudan, Swaziland, TANZANIA, UGANDA, Zambia, Zimbabwe,. Many countries within the Range States are CMS Parties.

6. Comments from Range States

Range States are currently involved in the development of Maccoa Duck Species Action Plan for the species.

7. Additional remarks

The on-going monitoring programme for the species under the Africa Waterbird Census programme coordinated by Wetlands International should continue and expand to more marginal areas within the Range States including the sites that have not been monitored consistently. There is need to develop a Memorandum of Understanding for the conservation and management of the species and its habitats among the Range States.

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[1] CMS Parties in capitals.

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

A. PROPOSAL: Listing the entire population of *Rynchops flavirostris* on Appendix II

B. PROPONENT: Government of Kenya

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Aves
1.2	**Ordo**	Charadriiformes
1.3	**Familia**	Rynchopidae
1.4	**Species**	*Rynchops flavirostris*
1.5	**Common name(s)**	English: African Skimmer, Scissorbill French: Bec-en-ciseaux d'Afrique

2. Biological data

2.1 Distribution

Distributed in the Afrotropical region in major rivers and lakes south of the Sahara. Irregular and uncommon at several widely scattered localities but frequents and breeds in small numbers in eastern and southern Africa.

2.2 Population

The numbers are estimated at 7,000 – 13,000 (West & Central Africa), 8000-12000 (East and southern Africa). Most colonies of the species support about 50 pairs.

2.3 Habitat

Large rivers of low waters, bays, lakes, coastal lagoons, salt pans and open marshes. Rests and breeds on sand bars and beaches within its range.

2.4 Migrations

Locally common resident in the Afrotropical region. Migrates north and south of Sahara in large rivers and inland lakes.

3. Threat data

3.1 Direct threat

Habitat disturbance of colonies by human and cattle. Disturbance generally affects its breeding performance. Egg collections have been reported in some Range States. Occasional rise in water levels during breeding swamps the breeding islands affecting breeding success.

3.2 Habitat destruction

General catchments degradations that affect the river flows and water volumes of lakes. Pollution and chemical use around lakes that affect fish abundance for this species and for all other fish eating birds.

3.3 Indirect threat

Overfishing and decimation of native fish fauna by introduced predators in some wetlands within its distribution range. Dam buildings that affect the river flows and competition from other fish easting birds particularly terns could be other factors affecting the species.

3.4 Threat connected especially with migrations

None known.

3.5 National and international utilization

None known.

4. Protection status and needs

4.1 National protection status

Protected under Wildlife Act as all other wildlife species in Kenya, but has no special protection at present.

4.2 International protection status

Listed as globally near-threatened (NT). Additionally listed in eastern Africa as regionally threatened/vulnerable. Presently not listed in any of the CMS Appendices.

4.3 Additional protection needs

Protection of the known breeding colonies and staging areas is essential within the Range States.

5. Range States[1]

ANGOLA, CAMEROON, CHAD, DEMOCRATIC REPUBLIC OF CONGO (Zaire), KENYA, Malawi, MALI, Mozambique, NIGER, NIGERIA, SENEGAL, TANZANIA, UGANDA, Zambia, Zimbabwe.

6. Comments from Range States

Kenya: Species currently listed as a priority for more inventories and breeding surveys.

7. Additional remarks

A monitoring programme for waterbirds including this species is on-going in Kenya, but more specific research programmes targeting this species has been prioritized.

8. References

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[1] CMS Parties in capitals.

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

A. PROPOSAL: Inclusion of all populations of mako sharks, Genus *Isurus*, on Appendix II

Summary: The shortfin and longfin mako sharks are warm-blooded, fast-swimming pelagic sharks that migrate through tropical and temperate seas worldwide. They have a low intrinsic rate of population increase and are exposed to high fishing mortality throughout their range. Their flesh is very valuable. They are targeted by oceanic, offshore and shelf fisheries, primarily in commercial long-line and hook and line fisheries, but also with net gear and to a lesser extent, as an important game fish, by recreational anglers. They are also a highly valued utilised bycatch of large-scale oceanic teleost fisheries, their meat and fins being marketed. Major declines in abundance of these species have been reported and they are listed as 'Vulnerable' by IUCN. Makos have been identified by fisheries management and biodiversity instruments as a high priority for regulation in order to reduce exploitation rates, but no such management has yet been implemented. A listing on Appendix II of CMS would provide additional support for introducing collaborative management of these species by Range States under the proposed CMS Migratory Sharks Instrument.

B. PROPONENT: Government of Croatia

C. SUPPORTING STATEMENT:

1. Taxon

1.1	**Classis**	Chondrichthyes, subclass Elasmobranchii
1.2	**Ordo**	Lamniformes, Mackerel sharks
1.3	**Familia**	Lamnidae
1.4	**Genus**	*Isurus* Rafinesque, 1810
	Species	*Isurus oxyrinchus* Rafinesque 1810; *Isurus paucus* Guitart, 1966
1.5	**Common name(s)**	English: Makos, mako sharks, Mackerel sharks. Shortfin and longfin mako French: Taupe bleu et petit taupe Spanish: Marrajo dientuso y marrajo carite Japan: Awozame-zoku

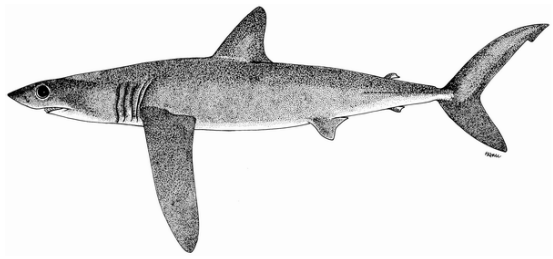


Figure 1a. Shortfin mako *Isurus oxyrinchus*
Total length to ~4 m.

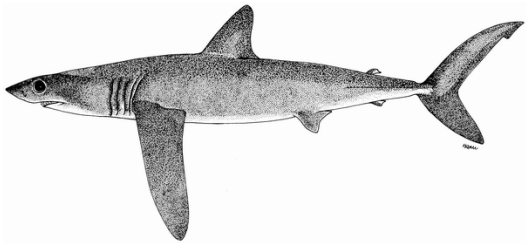


Figure 1b. Longfin mako *Isurus paucus*
Images from www.fao.org/fi

2. Biological data

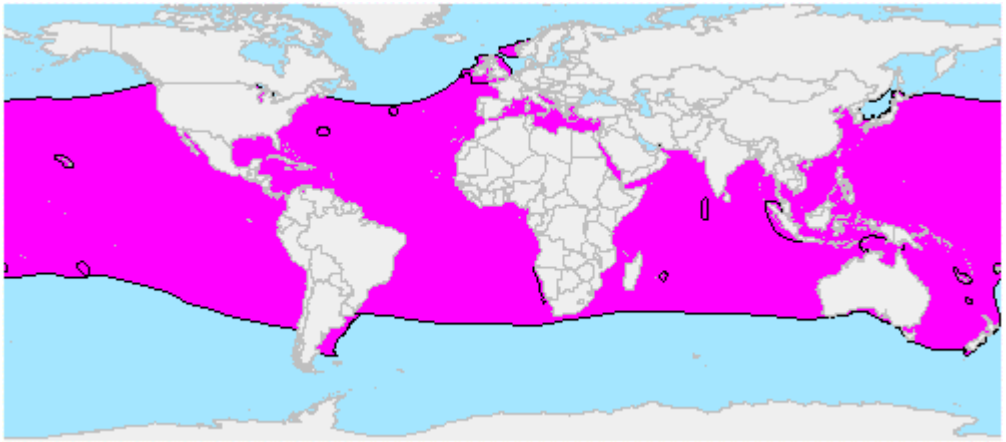
2.1 Distribution

Both species are probably circumglobal in tropical and warm temperate oceanic waters, although the longfin mako, a less common species, is not always accurately recorded in catches because it is often misidentified as shortfin mako or discarded at sea. Its reported distribution is, therefore, sporadic and not fully documented (Compagno 2001). The shortfin mako also occurs close inshore, particularly where the continental shelf is narrow, and in cooler temperate seas as well as in tropical areas, being distributed between about 50°N (up to 60°N in the Northeast Atlantic) to 50°S. It is not normally found in surface waters below 16°C (Compagno 2001).

Although there are many records from tagging programmes of transoceanic and transequatorial migrations, recent genetic research in the Atlantic suggests that the global distribution of shortfin mako is composed of several distinct populations. Shortfin mako sharks in the north and south Atlantic are genetically-distinct (Heist *et al.* 1996). Female makos from the eastern and western North Atlantic can be distinguished on the basis of their mitochondrial DNA, although a lack of differentiation in nuclear DNA suggests male mixing across the North Atlantic (Heist *et al.* 1996, Schrey and Heist 2003). The Atlantic and Indo-Pacific populations of longfin mako are possibly isolated, separated by cold waters off southern Africa and southern South America.

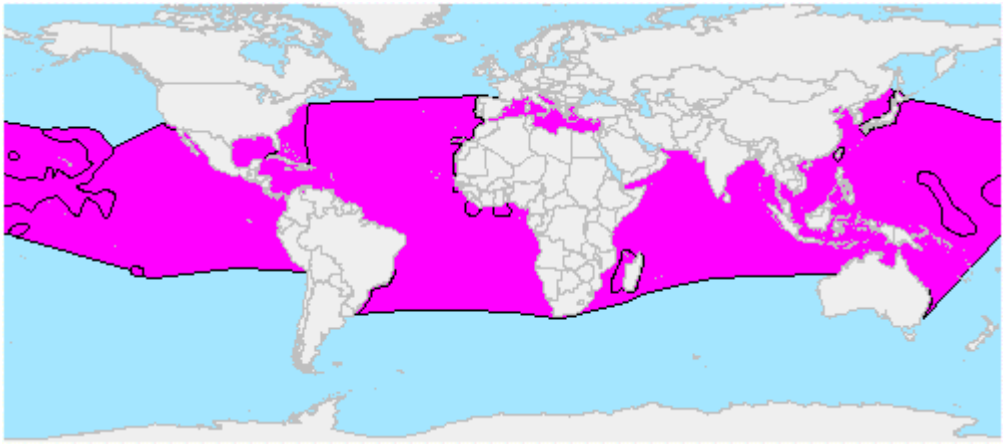
There appears to have been a reduction in the former range of shortfin mako in the Northeast Atlantic and Mediterranean; records are now extremely uncommon in some areas where it was formerly captured (Stevens et al. 2008). Longfin mako is apparently a much rarer species. It seems to be most common in the Western Atlantic and Central Pacific.

Figure 2a. Species distribution map for Shortfin mako (*Isurus oxyrinchus*)



FAO Areas: 21, 27, 31, 34, 37, 41, 47, 51, 57, 61, 67, 71, 77, 81 & 87. www.fao.org/figis

Figure 2b. Species distribution map for Longfin mako (*Isurus paucus*)



FAO Areas: 21, 27, 31, 34, 41, 47, 51, 57, 61, 71, 77 & 81. www.fao.org/figis

2.2 Population

There are no population estimates for either of the mako sharks. Their relative abundance compared with other oceanic shark species is provided by fisheries data. For example, shortfin mako contribute some 9.5% to 10% of the pelagic sharks caught by the Spanish longline fleets targeting sharks and swordfish in the Atlantic and Pacific Oceans (Mejuto et al. 2002, 2005, 2006, 2007). The longfin mako is vulnerable to bycatch in the same fisheries, but is significantly less abundant.

Fisheries data provide evidence of past and current population declines, for shortfin mako or for both species combined, in several areas. These are itemised in Stevens *et al*. 2008 and Reardon *et al*. 2006, and a few examples are presented below. These declining trends will continue in the absence of adequate management of the fisheries driving them.

In the North Atlantic, a 2004 ICCAT stock assessment workshop reported that shortfin mako stock depletions are likely to have occurred, based on catch per unit effort (CPUE) declines of 50% or more. ICCAT (2005) documented population declines of up to 70% in the North Atlantic Ocean. Demographic model results varied widely, with one approach suggesting present stock size is about 80% of virgin level, and another approach suggesting reductions to about 30% of virgin biomass in the 1950s (Cortés *et al*. 2007). In the Northwest Atlantic, analysis of CPUE from the US pelagic longline fishery logbooks reported that *Isurus* spp. may have declined by about 40% in the Northwest Atlantic between 1986-2000 (Baum *et al*. 2003). A more recent assessment of observer data for the same fishery found a similar instantaneous rate of decline of 38% between 1992-2005 (Baum *et al*. in prep.). A similar analysis of the same dataset and species grouping that restricted the areas of analysis to account for unbalanced observations, resulted in an overall decline of 48% from the beginning to the end of the time series (1992-2005) (Cortés *et al*. 2007). Off the Canadian coast, at the fringes of shortfin mako distribution, there was a decline in the large pelagic shark fishery during the 1970s and the median size of sharks caught has declined since 1988, possibly indicating a loss of larger sharks (Campana *et al*. 2005).

In the South Atlantic, the magnitude of decline is apparently smaller than in the North Atlantic and the stock size appears to lie above maximum sustainable yield, although only one modeling approach could be applied to the available data and assessments results were less

certain than for the North Atlantic (Stevens *et al*. 2008). For both populations, a lack of data on life history and catches hamper these calculations. If historical catches were higher than estimated, the likelihood of the stock being below the biomass at MSY will surely increase (ICCAT 2005).

Shortfin mako was considered common throughout the Mediterranean at the beginning of the 20th Century, but is now absent in some regions including the Ligurian Sea (Boero & Carli 1979) and Eastern Adriatic (Soldo and Jardas 2002) and very rare in the central and eastern Mediterranean, presumably as a result of driftnet and longline captures during the past 50 years. Ferreti *et al*. (2008) identified a decline of over 96% in mako and four other large shark species in the western and central Mediterranean (Figure 3). It is now assessed as Critically Endangered here (Stevens *et al*. 2008).

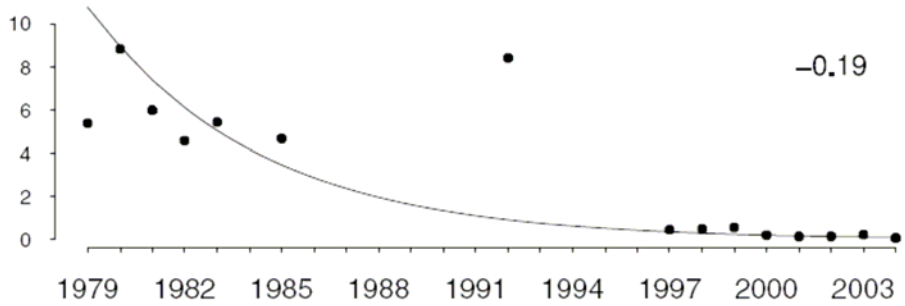


Figure 3. Trend in biomass per unit effort of shortfin mako (*Isurus oxyrinchus*) in the western and central Mediterranean Sea (from Ferreti *et al*. 2008).

Trend data are largely lacking from the Indo Pacific, but the pelagic longline fisheries that capture these species are also widespread and unregulated in these waters. Shortfin landings in Ecuador declined from a high of 2,000 t in 1994 to lows approaching 100 t in 2000 and 2001 (Herrera *et al*. in press). Sightings of mako sharks by anglers off the New Zealand coast and recapture rates of tagged makos have declined in the past decade, following peak years in 1995–1997 (Holdsworth and Saul 2008). Stevens *et al*. (2008) consider that it is reasonable to assume that decreases may be occurring in those areas for which there are limited or no data.

2.3 Habitat

The makos are primarily oceanic pelagic sharks, ranging widely in the enormous habitat of the oceans' upper pelagic waters, largely beyond the continental margins of the world. The shortfin mako also enters the littoral zone of shelf waters and can occur close to the coast where the coastal shelf is narrow. The shortfin mako is usually confined to waters warmer than 16°C (on the surface) to depths of at least 500m. Tracking studies have found that regular dives are made into deep water during the day where the temperature is low as 10°C (Holts and Kohin 2003). These are probably feeding dives (Sepulveda *et al*. 2004). There is very little information available on the location of mating, pupping or nursery grounds, although pregnant females, newborns and juveniles have regularly been reported from a few areas (summarized in Stevens *et al*. 2008). The longfin mako is also reported from the surface of the ocean but likely spends more time in deeper waters.

2.4 Migrations

Shortfin mako is one of the fastest swimming fishes in the sea and a highly migratory species. In addition to undertaking very long distance journeys across ocean basins, this species tends to follow movements of warm water masses polewards in the summer, in the extreme northern and southern parts of its range and moves between deep water over continental slopes and inshore areas, particularly where the shelf is narrow. Some of these migrations have been described from a combination of tracking, tagging and genetic studies.

One of the largest tagging studies was conducted by the National Marine Fisheries Service (USA) in the western Atlantic. This tagged 2459 shortfin mako during 1962–1989. Fishers from 16 countries reported 231 recaptures (9.4% of releases) of these tagged sharks. The maximum time at liberty was 8.2 years, and the maximum straight-line distance between tag and recapture localities is 2452 nautical miles. One tag was recovered from the European side of the Mid-Atlantic Ridge (Casey and Kohler 1992). The lack of differentiation in nuclear DNA suggests male mixing across the North Atlantic, although there appear to be separate female mako populations in the east and west (Heist *et al.* 1996, Schrey and Heist 2003).

Shortfin mako sharks have been tagged off the coast of New Zealand by sports anglers for many years. There have been 96 recaptures from outside New Zealand waters. The longest distance recorded was about 3000 nautical miles to the Marquesas Islands, and the longest duration at liberty was 6.5 years. Recaptures are clustered around Fiji (50 captures), New Caledonia, and the east coast of Australia (Queensland and New South Wales) (Holdsworth and Saul 2008). Off the Natal Kwa-Zulu coast of South Africa, makos move from offshore and inshore waters. Off the Californian coast, eight archival tags deployed for 2–4 months popped up from 20-911 km from their deployment locations (Holts and Kohin 2003).

No such data are available for the rarer longfin mako, but it is virtually certain to undertake similar long distance movements in pelagic waters. Compagno (2001) suggests that females of this species may approach land to pup.

3. Threat data

Threats to the mako sharks arise from the combination of their low productivity and consequently high intrinsic vulnerability to over-exploitation with the intensive and largely unregulated fisheries that cause them to suffer high fishing mortality throughout their range (Dulvy *et al*. 2008). Detailed information is available in Stevens *et al*. (2008) and Reardon *et al*. (2006) – the primary sources for the following information.

3.1 Direct threat to the population

The shortfin mako is targeted for its meat and fins by the large longline fishing fleets that operate in the Atlantic, Pacific and Indian Oceans. It makes up about 7% of total catches in the Atlantic swordfish fishery, about 5% of total catches in the rapidly expanding Pacific swordfish fishery, and about 10% by weight of all North Atlantic shark catches (Mejuto ops. cit.). It is an important catch in Indonesia's tuna fisheries. It is also a target and utilized bycatch of other smaller-scale fisheries. The comparatively uncommon longfin mako is apparently not targeted for its meat, but its fins are very valuable and it is likely to be utilized rather than released when taken as bycatch.

These threats operate in all parts of the mako sharks' range and fisheries may target any age class of sharks present in the area. For example, early juveniles were the target of a drift longline fishery off California during the 1980s (Cailliet *et al.* 1993).

The shortfin mako is also a prized gamefish and targeted by sports anglers in many parts of the world, including USA, New Zealand and some European countries. Several sports fisheries are now primarily focused on tag and release rather than retention of the catch.

With the exception of finning bans (which prohibit the retention of shark fins and discard of shark carcasses), no fisheries regulations have been adopted for the sustainable management of the sharks that are targeted or taken as bycatch in these oceanic fisheries.

3.2 Habitat destruction

Habitat destruction is not currently of concern for these wide ranging warm water oceanic species, although ocean acidification resulting from rising global levels of CO_2 could have serious future implications for marine ecosystems.

3.3 Indirect threat

The chief indirect threat to these species is their high intrinsic vulnerability to over-exploitation in fisheries. These apex predators have few natural enemies in the marine environment. Their reproductive strategy comprises slow growth, late maturity, small litters of large pups and high longevity. Life history parameters are summarized in Table 1, taken from the IUCN Red List Assessments for the mako sharks. These parameters vary between ocean basins for the shortfin mako, but there are sufficient data to demonstrate the likely low intrinsic rate of population increase for this species. In contrast, very few demographic data are available for the much rarer longfin mako shark. However, this species grows to a larger size and its pups are born at a much larger size in smaller litters This implies that it has a lower fecundity and even lower ability to sustain fisheries.

Table 1. Life history parameters of the mako sharks genus *Isurus*

Life history parameter		Shortfin mako *Isurus oxyrinchus*	Longfin mako *Isurus paucus*
Age at maturity (years)	males:	7-9	Unknown
	females:	18-21	Unknown
Size at maturity (total length cm)	female:	265-280; 275-293, 301-307	>245cm TL (Compagno 2001)
	male:	195; 203-215, 198-204	Smallest reported mature male: 229cm TL (Castro in prep)
Longevity (years)		29-32	Unknown
Maximum size (total length cm)		296 (males); at least 394 (females)	At least 426.7cm TL (Castro in prep)
Size at birth (cm)		60-70	97-120 cm (Compagno 2001)
Average reproductive age (years)*		25.2 (E. Cortés unpubl. data)	Unknown
Gestation time (months)		15-18	Unknown
Reproductive periodicity		Every 3 years	Unknown
Litter size		4-25 (mean 12.75)	2-8 young in a litter (Castro *et al.* 1999, Compagno 2001)

Annual rate of population increase	e^r=1.068 (E. Cortés unpubl. data) r = .046 yr^{-1} (S. Smith pers. comm.)	Unknown
Natural mortality	0.065-0.100 yr^{-1} (E. Cortés unpubl. data)	Unknown

Sources cited in Stevens *et al*. 2008 and Reardon *et al*. 2006: Bishop *et al.* (2006), Pratt and Casey (1983), Cliff *et al*. (1990), Compagno (2001), Dulvy *et al*. (2008), Francis and Duffy (2005), Garrick (1967), Mollet *et al*. (2002), Natanson *et al.* (2006), Smith *et al*. (1998), Stevens (1983).

3.4 Threat connected especially with migrations

Because mako sharks regularly migrate between the EEZs of different range states and into the high seas, no part of any stock can benefit fully from any management measures that may be introduced within its waters by a single Range State. These measures will not apply to other fleets fishing the same stock in their EEZs or on the high seas, where shark fisheries are largely unregulated.

3.5 National and international utilisation

As already noted, the shortfin mako shark is utilized nationally and internationally for its meat. It is also utilized internationally for its fins, which enter the fin trade in large quantities. Clarke *et al*. 2006a estimated from a market study that the fins of between 500,000 and 1,000,000 individual mako sharks (biomass 25,000 to 40,000 tonnes) enter the shark fin trade worldwide each year. This is much higher than reported catches. Clarke *et al*. 2006b used genetic analysis of fins in trade to classify trader categories by species. They estimated that shortfin mako comprise about 2.7% of the total fin trade (not including shortfin mako fins that are classified with silky sharks by traders). Although longfin makos are much less abundant in catches and trade, this species was also identified regularly in fin markets, sometimes in a species-specific market classification and sometimes classified with shortfin mako or thresher shark fins.

4. Protection status and needs

4.1 National protection status

Shortfin mako:

South Africa: bycatch & recreational bag limit.

New Zealand: Managed under Quota management system.

Chile: gear regulations for artisanal fishery.

Atlantic US: Commercial quotas. Limited entry, time-area closures. Recreational bag limits.

Pacific US: Closure of targeted longline fishery. Recreational fishery bag limits in California. Harvest guidelines for California, Oregon and Washington.

Atlantic Canada: COSEWIC ‘At Risk’ species. Subject of catch and bycatch limits. License limits, gear restrictions, area and seasonal closures, recreational hook and release only.

Pacific Canada: Limited entry, time-area closures.

At least 19 countries, including many Range States, have adopted finning bans (Camhi *et al*. 2008), but these are unlikely to reduce mortality in this species because it is so highly valued for its meat as well as for fins.

Longfin mako:

South Africa: bycatch & recreational bag limit.

Prohibited Species on the US Highly Migratory Shark Fisheries Management Plan.

The number of States adopting National Shark Plans is also increasing and includes other range States, but no other species-specific management or species protection measures for mako sharks have been identified under these instruments.

4.2 International protection status

The mako sharks are listed on Annex I, Highly Migratory Species, of UNCLOS, in recognition of the importance of collaborative management for these sharks. No catch limits for any pelagic sharks have been adopted by the regional fisheries management organisations established to regulate high seas fisheries. Although the ICCAT Scientific Committee has recommended reducing fishing mortality on North Atlantic shortfin mako sharks, but this recommendation may not be implemented within the foreseeable future. The 2005 ICCAT shark stock assessment workshop has recommended improved research and monitoring of shortfin mako.

The makos may be benefiting from the finning bans that have now been introduced by nine of the tuna commissions (the regional fisheries management organizations for high seas pelagic fisheries), including in the Atlantic (ICCAT), Eastern Pacific (IATTC) and Indian Ocean (IOTC) (Camhi et al. 2008), but this is unlikely to reduce mortality for shortfin mako, because it is retained for its meat as well as its fins. Longfin mako could benefit from these measures if they result in the live release of bycatch.

The shortfin mako is listed under Annex III of the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and Appendix III of the Bern Convention on the Conservation of European Wildlife and Natural Habitats, which permit a certain level of exploitation if population levels allow (Bern) or require exploitation to be regulated (Barcelona); however these regulations have yet to be implemented (Serena, 2005).

4.3 Additional protection needs

The provisions of the listings on the Barcelona and Bern Conventions (these envisage regulation of exploitation to sustainable levels in Mediterranean and European waters), urgently need to be implemented, particularly for the Critically Endangered Mediterranean shortfin mako population.

The shortfin mako shark has been included by the CITES Animals Committee on a list of species that may require consideration for inclusion in the CITES Appendices, if their management and conservation status does not improve. The Animals Committee recommended to the 13th Conference of Parties to CITES in 2004 that range States pay particular attention to the management of fisheries and trade in these species, including undertaking reviews of their conservation and trade status. This recommendation was not

implemented. In 2007, the Animals Committee again drew the attention of FAO, Parties and RFBs to these species so that they may be prioritized for more accurate recording in catches, landings and trade. These recommendations need to be implemented.

Dulvy *et al.* (2008) reached the following conclusions on management needs for the makos and other threatened pelagic sharks: "Overall, despite widespread acknowledgment and understanding of their intrinsic vulnerability to overexploitation and numerous commitments to conserve them, oceanic pelagic sharks and rays remain a low priority for resource managers and continue to be over-exploited. To improve the conservation status of these species and ensure they are exploited sustainably, fishery managers and other government officials have the ability to take immediate, decisive action at national, regional and international levels. These actions include: implementing and enforcing finning bans (requiring sharks to be landed with fins attached) and scientifically-based (or precautionary) catch limits. Effective conservation of pelagic sharks and rays will also require developing new management tools for their conservation."

The proposed management actions and new management tools proposed by Dulvy *et al.* (2008) are reproduced in Table 2.

In particular, the mako sharks urgently require the introduction of collaborative sustainable science-based fisheries management measures by a much larger number of range States and particularly by those States whose fleets catch these species on the high seas. In order to obtain the data required for the development of scientific advice, it will be necessary to improve significantly species-specific data collection for catches and landings. Precautionary catch limits should be adopted until adequate scientific advice is available. Bycatch mitigation measures, to reduce discard mortality, could be highly valuable.

Since management measures introduced by a single range State are likely to be ineffective, because of the migratory nature of these species, these measures will only be effective if introduced by region or by entire ocean-basin. Unfortunately shark species are a low management priority for the Tuna Commissions, which have not yet adopted any catch or effort limits for sharks.

IUCN/CMS (2007) suggest that a CMS Appendix II listing could help to drive the improvements in regional management that mako sharks urgently require; for example by prompting improved synergies between environment and fisheries management authorities. Listing on CMS would also bring the makos within the scope of the proposed new CMS migratory sharks instrument.

Table 2. Proposed management actions that would contribute to rebuilding threatened populations of oceanic pelagic elasmobranchs and sustaining associated fisheries (from Table 4 in Dulvy *et al*. 2008)

Recommendations to fishing nations and Regional Fisheries Management Organizations:

I. implement, as a matter of priority, existing scientific advice for preventing overfishing, or to recover, pelagic shark populations (e.g. ICCAT Scientific Committee recommendation to reduce fishing mortality on North Atlantic shortfin mako sharks);
II. draft and implement Plans of Action pursuant to the IPOA-Sharks which include, wherever possible, binding, science-based management measures for pelagic sharks;
III. significantly improve observer coverage, monitoring, and enforcement in fisheries taking pelagic sharks;
IV. require the collection and accessibility of species-specific shark fisheries data;
V. conduct stock assessments for pelagic elasmobranchs;
VI. implement pelagic shark catch limits, ensuring these are precautionary where sustainable catches are scientifically uncertain;
VII. strengthen finning bans by requiring sharks to be landed with fins attached. Until then, ensure fin-to-carcass ratios do not exceed 5% of dressed weight (or 2% of whole weight) and standardize Regional Fisheries Management Organizations finning bans to specify ratios apply to dressed rather than whole weight;
VIII. promote research and gear modifications aimed at mitigating elasmobranch bycatch and discard mortality; and
IX. commence programmes to reduce and eventually eliminate overcapacity and associated subsidies in pelagic fisheries.

Recommendations to country governments:

I. ensure active membership in CITES, CMS, Regional Fisheries Management Organizations and other relevant international agreements;
II. adopt bilateral fishery management agreements for shared, pelagic elasmobranch stocks;
III. propose and work to secure pelagic shark management at Regional Fisheries Management Organizations;
IV. ensure full implementation and enforcement of CITES shark listings based on solid non-detriment findings, if trade in listed species is allowed;
V. collaborate on regional agreements for CMS-listed shark species;
VI. promote and support the advice of the CMS Scientific Council and the CITES Animals Committee with respect to sharks;
VII. propose and support the listing of additional threatened pelagic shark species under CMS and CITES; and
VIII. develop and promote options for new international and global conservation agreements for migratory sharks.

5. Range States

Shortfin mako *Isurus oxyrinchus*	**Longfin mako *Isurus paucus***
Parties to CMS: Algeria, Angola, Antigua and Barbuda, Argentina, Australia, Bangladesh, Benin, Cameroon, Chile, Congo, Cook Islands, Cyprus, Côte d'Ivoire, Croatia, Ecuador, Egypt, Eritrea, France (French Polynesia, Guadeloupe, Guyana, New Caledonia), Gambia, Ghana, Greece (East Aegean Is.; Kriti), Guinea, Guinea-Bissau, Honduras, India, Iran (Islamic Republic of), Ireland, Israel, Italy (Sardegna; Sicilia), Kenya, Liberia, Libyan Arab Jamahiriya, Madagascar, Morocco, New Zealand, Nigeria, Norway, Palau, Pakistan, Panama, Peru, Philippines, Portugal, Senegal, Somalia, South Africa, Spain (Baleares; Canary Is.), Sri Lanka, Tunisia, United Kingdom (Bermuda, British Virgin Islands, Gibraltar), United Republic of Tanzania, Uruguay, Yemen. Other range States: Bahamas, Barbados, Belize, Brazil, Brunei Darussalam, Cambodia, China, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Equatorial Guinea, Fiji, French Guiana, Gabon, Guatemala, Indonesia, Jamaica, Japan, Kiribati, Korea, Democratic People's Republic of, Korea, Republic of, Malaysia, Maldives, Marshall Islands, Mexico, Micronesia, Federated States of, Mozambique, Myanmar, Namibia, Nauru, Nicaragua, Northern Mariana Islands, Oman, Papua New Guinea, Pitcairn, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Montenegro, Russian Federation, Sierra Leone, Singapore, Sudan, Suriname, Taiwan, Province of China, Thailand, Timor-Leste, Tonga, Trinidad and Tobago, Turkey, Turks and Caicos Islands, Tuvalu, United States, Venezuela, Viet Nam, United States, Virgin Islands.	Probably circumtropical in oceanic waters, but recorded distribution sporadic and not fully documented (Compagno 2001). Parties to CMS: Australia, Cape Verde Islands, Ghana, Guinea-Bissau, Liberia, Madagascar, Mauritania, Morocco, Portugal, South Africa, Spain, probably other Mediterranean States. Other range States: Brazil, Cuba, Japan, Federated States of Micronesia, Nauru, Solomon Islands, Taiwan Province of China, United States.

6. Comments from Range States

7. Additional Remarks

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

A. PROPOSAL: Inclusion of *Lamna nasus* (Bonnaterre, 1788) on Appendix II

B. PROPONENT: European Community and its Member States

C. SUPPORTING STATEMENT:

1. Taxon

	Kingdom:	Animalia
	Phylum:	Chordata
1.1	**Classis**:	Chondrichthyes, subclass Elasmobranchii
1.2	**Ordo**:	Lamniformes
1.3	**Familia**:	Lamnidae
1.4	**Species**:	*Lamna nasus* (Bonnaterre, 1788)
1.5	**Common Name(s)**:	English: porbeagle French: requin-taupe commun (market name: veau de mer) Spanish: marrajo sardinero; cailón marrajo, moka, pinocho Dutch: Neushaai Danish: sildehaj German: heringshai (market name: kalbfish, see-stör) Italian: talpa (market name: smeriglio) Japanese: mokazame Swedish: hábrand; sillhaj

2. Biological data

The large, highly migratory and aggregating, warm-blooded porbeagle shark (*Lamna nasus*) occurs in temperate North Atlantic and southern ocean waters. It is relatively slow growing, late maturing, and long-lived, bears small litters of pups and has a generation period of 20–50 years and an intrinsic rate of population increase of 5-7% per annum. It is a high value species, whose aggregations may be targeted by fishers, and is therefore highly vulnerable to over-exploitation in fisheries.

L. nasus is an apex predator, occupying a position near the top of the marine food web (it feeds on fishes, squid and some small sharks, but not on marine mammals [Compagno 2001, Joyce *et al*. 2002)]. It has few predators other than humans, but orcas and white sharks may take this species (Compagno 2001). Fisheries and Oceans Canada (2006) considers that the abundance of NW Atlantic population is now too low for this species still to have any indirect value through its role in ecosystem function or regulation. Stevens *et al*. (2000) warn that the removal of populations of top marine predators may have a disproportionate and counter-intuitive impact on trophic interactions and fish population dynamics, including by causing decreases in some of their prey species.

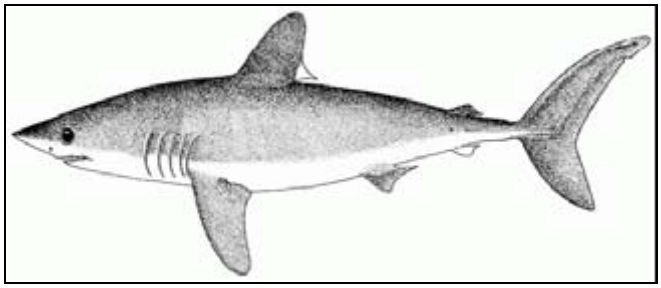

Figure 1. Porbeagle *Lamna nasus* (Source: FAO Species Identification Sheet)

Age at maturity (years)	female:	13 years at 50% maturity (North Atlantic); 15–19 years (South Pacific)
	male:	8 years at 50% maturity (North Atlantic); 8–10 years (South Pacific)
Size at maturity (total length cm)	female:	195 cm (South Pacific), 245 cm (North Atlantic)
	male:	165 cm (South Pacific), 195 cm (North Atlantic)
Maximum size (total length cm)	female:	≥355
	male:	≥260
Longevity (years)		>26 in fished population, theoretical estimates up to 46 years in unfished population need verification (Northwest Atlantic); probably at least 40 years and possibly twice that (South Pacific)
Size at birth (cm)		68–78
Average reproductive age *		20–25 years (Northwest Atlantic); possibly 30–50 (South Pacific)
Gestation time		8–9 months
Reproductive periodicity		Annual
Average litter size		1–5 pups (average 4)
Annual rate of population increase		0.05–0.07
Natural mortality		0.10 (immatures), 0.15 (mature males), 0.20 (mature F) (Northwest Atlantic

Table 1. Life history parameters of the porbeagle shark (*Lamna nasus*, Bonnaterre, 1788)

2.1 Distribution

Lamna nasus occurs largely between latitude 30–60 degrees South, in a circumglobal band in the southern hemisphere, and 30–70 degrees North in the North Atlantic Ocean (Compagno 2001, see Figure 2). No information is available on any changes in the geographic range of *Lamna nasus*, but this species now appears to be scarce, if not absent, in areas where it was formerly commonly reported (e.g. in the Western Mediterranean, Alen Soldo *in litt*. 2003).

This species is wide-ranging in the following oceans:

- Northwest Atlantic: Greenland, Canada, United States, and Bermuda.
- Northeast Atlantic: Iceland and western Barents Sea to Baltic, North and Mediterranean Seas, including Russia, Norway, Sweden, Denmark, Germany, Holland, United Kingdom,

Ireland, France, Portugal, Spain and Gibraltar; Mediterranean (not Black Sea); Morocco, Madeira, and Azores.

- Southern Atlantic: southern Brazil and Uruguay to southern Argentina; Namibia and South Africa.
- Indo-West Pacific: South-central Indian Ocean from South Africa east to between Prince Edward and Crozet Islands, between Kerguelen and St. Paul Islands, and southern Australia, New Zealand. Sub Antarctic waters off South Georgia, Marion, Prince and Kerguelen Islands.
- Eastern South Pacific: southern Chile to Cape Horn.
- Range States and areas, FAO Fisheries Areas and ocean distribution are listed under point 5.

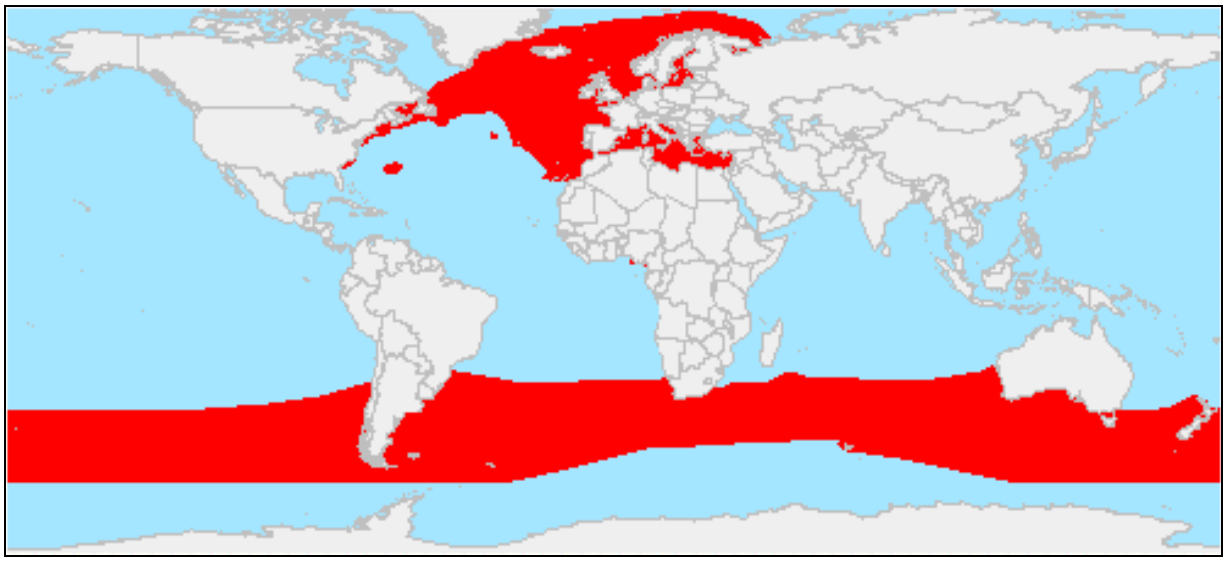

Figure 2. Global *Lamna nasus* distribution (Source: FAO FIGIS 2004)

2.2 Population

The only stock for which population size data are available is in the Northwest Atlantic. The most recent stock assessments (DFO 2005a, Gibson and Campana 2006) have estimated the total population size for this stock as 188,000–191,000 sharks (21–24% of virgin numbers; possibly 800,000 to 900,000 fishes) and 9,000–13,000 female spawners (12–15% of virgin abundance, which might have been 60,000 to 110,000 mature females). Northeast Atlantic and southern hemisphere population sizes are unknown. The population structure of exploited populations is unnatural. Large mature females are not well represented in heavily fished, depleted stocks (e.g. Campana *et al*. 2001).

The estimated generation time for *L. nasus* is between 20 and 25 years in the North Atlantic, possibly 30–50 years in the Southern Oceans (see section 3.3). The three-generation period against which recent declines might be assessed is at least 60 to 75 years, greater than the historical baseline for most stocks.

Year	Location	Data used	Trend	Source
1936–2005	Northeast Atlantic	Norwegian landings	99% decline from baseline	Norwegian and ICES data
1936–2005	Northeast Atlantic	Target fishery catches	90% decline from baseline	Norwegian, French and ICES data
1936–2005	Northeast Atlantic	All landings data	85% decline from baseline	Norwegian (pre-1973) and ICES data
1978–2005	Northeast Atlantic	French landings ~	50% decline in ~30 yrs	French & ICES data
1994–2005	Northeast Atlantic	Landings per vessel ~	70% decline in ~10 years	French data
1964–1970	Northwest Atlantic	Norwegian landings ~	90% decline in catch	Landings data
1961–2000	Northwest Atlantic	Stock assessment	83–89% decline from virgin biomass	Canadian DFO 2001a
1961–1966	Northwest Atlantic	Stock assessment	>50% decline in abundance	Canadian DFO 2005a
1961–2004	Northwest Atlantic	Stock assessment	85–88% decline in mature female abundance	Canadian DFO 2005a
1992–2002	Southwest Pacific	Pelagic longline CPUE	>50–80% decline in 10 yrs	New Zealand Ministry of Fisheries 2006
1983–1993	Southwest Atlantic	CPUE by pelagic tuna longlines, Uruguay	80–90% decline in 10 yrs	Domingo (2000)

Table 1. Summary of population and catch trend data

Lamna nasus has been fished in the **Northeast Atlantic** region by many European countries. Reported landings from the historically most important fisheries, around the United Kingdom and in the North Sea and adjacent inshore waters (ICES areas III & IV) have decreased to very low levels during the past 30–40 years, while catches from the offshore ICES sub-regions west of Portugal (IX), west of the Bay of Biscay (VIII) and around the Azores (X) have increased since 1989. This is attributed to a decline in heavily fished and depleted inshore populations and redirection of effort to previously lightly exploited offshore areas. The International Council for the Exploration of the Sea ICES (ICES 2005) noted: "The directed fishery for porbeagle [in the Northeast Atlantic] stopped in the late 1970s due to very low catch rates. Sporadic small fisheries have occurred since that time. The high market value of this species means that a directed fishery would develop again if abundance increased. There are no indications of stock recovery." Both ICES and the European Scientific, Technical and Economic Committee for Fisheries (STECF) consider porbeagle to be depleted in the NE Atlantic, and stocks elsewhere in the world, including the NW Atlantic, are also considered depleted (ICES WGEF, 2007). A full stock assessment is not currently available, but because this population was depleted well before that in the Northwest Atlantic and has not benefited from fisheries management measures, it is presumed to be at least as seriously depleted than that in Canadian waters, where unrestricted catch trends were very similar.

The United Kingdom identified *L. nasus* as a species of conservation concern in its response to the Convention on Biological Diversity in 1995. It is included as Vulnerable on Germany's (1998) and Sweden's Red Lists. The IUCN Red List assessment for the Northeast Atlantic is **Critically Endangered**, taking into account past, ongoing and estimated future reductions in population size exceeding 90% (Stevens *et al.* 2005).

Lamna nasus has virtually disappeared from **Mediterranean** records. Two or three tonnes per annum were recorded during the late 1970s, but the last catch record was for one tonne landed by Malta in 1996 (FAO FIGIS 2006). Since then there have been only a few new records (A. Soldo unpublished data). The IUCN Red List assessment for the Mediterranean population is **Critically Endangered**, on the basis of past, ongoing and estimated future reductions in population size exceeding 90%, but this may be part of the Northeast Atlantic stock (Stevens *et al.*2005).

Targeted *Lamna nasus* fishing in the **Northwest Atlantic** started in 1961, following depletion of the Northeast Atlantic stock. By 1965 many vessels had switched to other species or moved to other grounds because of the population decline (DFO 2001a). The fishery collapsed after only six years, landing less than 1,000t in 1970, and took 25 years for only very limited recovery to take place. Catches of 1,000–2,000 t/year throughout the 1990th reduced population levels to a new low in under 10 years: the average size of sharks and catch rates were the smallest on record in 1999 and 2000, Total population numbers remained relatively stable between 2002 and 2005, although reproductive females continued to decline slightly. Population recovery from this depleted state is possible, but sensitive to human-induced mortality. The IUCN Red List categorises Northwest Atlantic *L. nasus* as **Endangered**, on the basis of estimated reductions in population size exceeding 70% that have now ceased through management (Stevens *et al*. 2005).

Although porbeagle landings from the **southern hemisphere** are only reported to FAO by New Zealand, New Zealand catch data for the Pacific southwest, primarily bycatch in tuna longlines, but also trawl and bottom longline catches, exceed total southern ocean catch records in FAO FIGIS (2006). There has been a 75% decline in the total weight of *L. nasus* reported since 1998–99, to a low of 60 t in 2004-05. This decline began during a period of rapidly increasing domestic fishing effort in the tuna longline fishery, and has accelerated since tuna longline effort dropped during the last two years. The abundance of *Lamna nasus* in shark bycatch of the Uruguayan pelagic tuna longline fleet declined during 1981–1998 (Domingo 2000). Japanese tuna longline vessels take an unknown quantity of bycatch of *L. nasus* in the southern bluefin tuna fishing grounds. Current stock levels are under investigation. The IUCN Red List categorises Southern Ocean *L. nasus* stocks as **Near Threatened** (Stevens *et al*. 2005).

2.3 Habitat

Lamna nasus is an active, warm-blooded, epipelagic shark inhabiting boreal and temperate waters, sea temperature 2–18°C, preferring 5–10oC in the Northwest Atlantic (Campana and Joyce 2004, Svetlov 1978). They are most common on continental shelves from near the surface to depths of 200m, but have occasionally been caught at depths of 350–700m. They range from close inshore (especially in summer), to far offshore (where they are often associated with submerged banks and reefs). They occur singly, in shoals, and in feeding aggregations. Stocks segregate (at least in some regions) by age, reproductive stage and sex and adults undertake seasonal sex-specific north-south migrations. Mature *L. nasus* are rarely seen in winter and early spring in the Northwest Atlantic, with monthly catches exhibiting a seasonal and sex-specific spring migration of mature sharks along the coast and outer edge of the Scotian shelf from the

Gulf of Maine towards the mating grounds off southern Newfoundland and the approaches to the Gulf of Saint Lawrence, but pupping grounds are unknown. Smaller immature sharks resident on the Scotian shelf appear not to undertake the same extensive migrations. (Campana *et al*. 1999, 2001, Campana and Joyce 2004, Compagno 2001, Jensen *et al*. 2002.) The Mediterranean may be a nursery ground (Stevens *et al*. 2005).

2.4 Migrations

The 'Family Isurida' (now Lamnidae, including *L. nasus*) is listed on Annex 1 (Highly Migratory Species) of the UN Convention on the Law of the Sea (UNCLOS). Extensive long distance migrations occur within the two North Atlantic stocks, which appear to be thoroughly mixed. Tagging studies in the Northwest Atlantic by Norwegian, American and Canadian researchers identified mainly short to moderate (1,500km) annual seasonal movements along the edge of the continental shelf between the Gulf of Maine and Newfoundland (Campana *et al*. 1999, Campana and Joyce 2004). with sharks moving into higher latitudes in summer here and also in the southern hemisphere stocks (Francis *et al*. 2008). Distances travelled by 143 porbeagle tagged in a US study ranged 4 to 1,005 nautical miles (nm), with a mean distance of 234 nm, with over 90% moving less than 500 nm from their original tagging location (Kohler *et al*. 2002). Mature *L. nasus* are rarely seen in winter and early spring in the Northwest Atlantic, with monthly catches exhibiting a seasonal and sex-specific spring migration of mature sharks along the coast and outer edge of the Scotian shelf from the Gulf of Maine towards the mating grounds off southern Newfoundland and the approaches to the Gulf of Saint Lawrence, but pupping grounds are unknown. Smaller immature sharks resident on the Scotian shelf appear not to undertake the same extensive migrations. (Campana *et al*. 1999, 2001, Campana and Joyce 2004, Compagno 2001, Jensen *et al*. 2002.) ICES Working Group on Elasmobranch Fishes (WGEF) 2007 and Heessen 2003 consider that there is a single Northeast Atlantic stock, from the Arctic Ocean to Northwestern Africa. FAO (2007), however, noted that evidence from Japanese catches in high seas longline fishing fleets (Matsumoto 2005) indicates the potential for a third North Atlantic stock off Iceland.

There is also direct evidence of trans-Atlantic movements from tagging studies and indirectly from the virtually identical genetic population structure on both sides of the North Atlantic. .In contrast, significant genetic differences between the northern and southern hemisphere populations imply little or no geneflow across the Atlantic equatorial waters that separate them (Pade *et al*. 2006).

Information is not available on migrations or stock structure in the southern hemisphere.

2.5 Movement between international borders

L. nasus tagged off southern England (the United Kingdom of Great Britain and Northern Ireland) have been recaptured off Spain, Denmark and Norway, having travelled 2,370km to the Norwegian recapture site. Sharks tagged off the Republic of Ireland have been recaptured off the Faroes, France and Canada, with movements of 2,300 km and 4,260km, suggesting not only mixing throughout their range in the Northeast Atlantic, but also across the Atlantic (Campana *et al*. 1999, Kohler and Turner 2001, Kohler *et al*. 2002, Stevens 1976 and 1990, Green 2007, Figure 3).

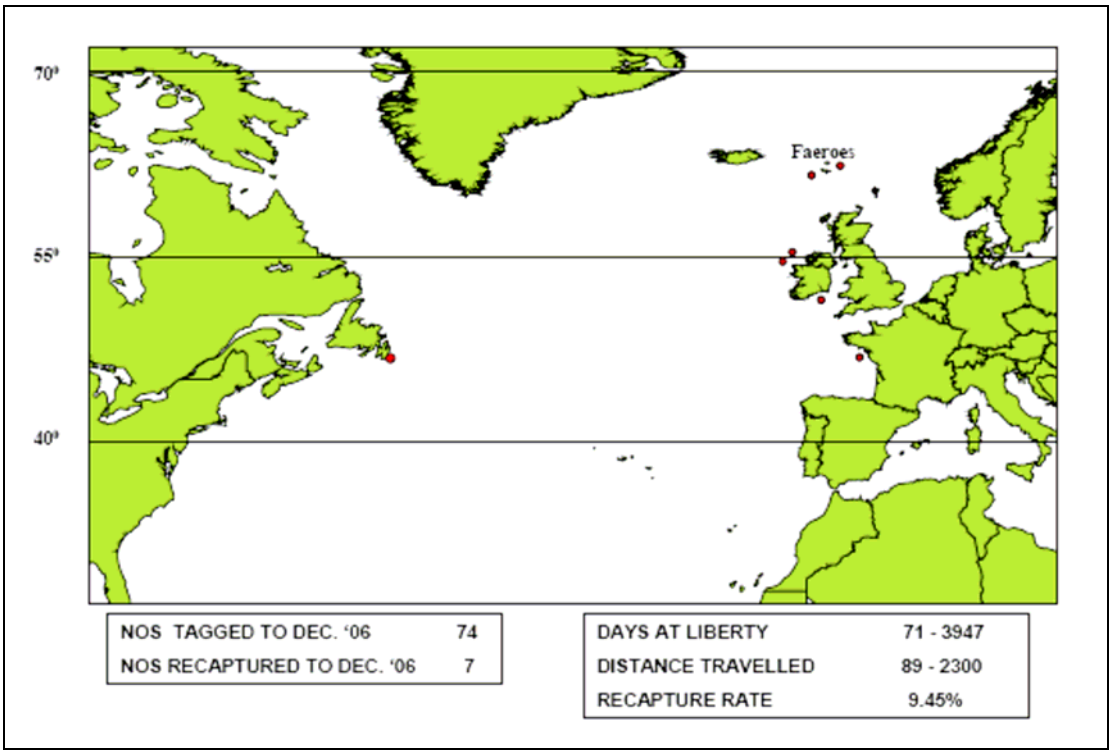

Figure 3. Recapture locations of porbeagle sharks in the Northeast Atlantic, from Irish Central Fisheries Board tagging programme (Green 2007).

3 Threat data

3.1 Direct threat or threat of the population

The principal threat to *L. nasus* worldwide is over-exploitation, in target and bycatch fisheries, with many products entering international trade. This species is particularly vulnerable to fisheries because these target both mature and large juvenile animals, the latter well before maturity.

Intensive directed fishing for the valuable meat of *L. nasus* was the major cause of population declines during the 20th century, but it is also a valuable, utilised 'bycatch' or secondary catch of longline pelagic fisheries for tuna and swordfish (Buencuerpo *et al*. 1998). *L. nasus* is also an important target game-fish species for recreational fishing in Ireland and the United Kingdom. The recreational fishery in Canada and the United States is small (FAO 2003, DFO 2001b). ICES (2005) noted: "The directed fishery for porbeagle [in the Northeast Atlantic] stopped in the late 1970s due to very low catch rates. Sporadic small fisheries have occurred since that time. The high market value of this species means that a directed fishery would develop again if abundance increased."

Lamna nasus bycatch is a valuable secondary target of many fisheries, particularly longline fisheries, but also gill nets, driftnets, trawls, and handlines. The high value of its meat means that the whole carcass is usually retained and utilised. ICES (2005) noted: "effort has increased in recent years in pelagic longline fisheries for bluefin tuna (Japan, Republic of Korea and Taiwan, province of China) in the North East Atlantic. These fisheries may take porbeagle as a bycatch. This fishery is likely to be efficient at catching considerable quantities of this species." Bycatch is often inadequately recorded in comparison with captures in target fisheries.

Despite the large amount of fishing activity that will result in *L. nasus* captures in the southern hemisphere, New Zealand is the only country that reports landings to FAO (but total FAO landings data are still lower than New Zealand's published data). Examples of important but largely unreported bycatch fisheries include the demersal longlines for Patagonian toothfish in the southern Indian Ocean (Compagno 2001) and by the Argentinean fleet (Victoria Lichtstein,CITES Management Authority of Argentina, *in litt*. to TRAFFIC Europe, 27 October 2003); longline swordfish and tuna fisheries in international waters off the Atlantic coast of South America (Domingo 2000, Domingo *et al*. 2001, Hazin *et al*. in press); the Chilean artisanal and industrial longline swordfish fishery within and outside the Chilean EEZ, between 26–36ºS (E. Acuña unpublished data; Acuña *et al*. 2002). *L. nasus* is rare in warm currents off the South African coast, but taken as bycatch in colder waters. A small bycatch occurs in Australian trawl fisheries for Patagonian toothfish and mackerel icefish around Heard and Macdonald islands (van Wijk and Williams 2003).

3.2 Habitat destruction

Critical habitats for this species and threats to these habitats are unknown. High levels of heavy metals (particularly mercury) bio-accumulate and may be bio-magnified in top oceanic predators, but their impacts on *L. nasus* population fitness is unknown. Effects of climatic changes on world ocean temperatures, pH and related biomass production could potentially impact *L. nasus* populations.

3.3 Indirect threat

3.4 Threat connected especially with migrations

The Porbeagle shark is not only a highly migratory but also a highly aggregating species, with migrating portions of the population thought to aggregate by age class, maturity and sex. Its aggregating habit makes this species highly vulnerable to fisheries, which can target areas where these aggregations may reliably be found and hence particularly sensitive portions of the population (such as large, mature females). There is significant potential for collaborative management to protect vulnerable aggregations, such as juveniles in nursery grounds or mature females on pupping grounds, but management initiatives by single range States (such as Norway, which has adopted ICES advice and prohibited targeted fishing for this species) is insufficient for the effective conservation of a highly migratory species such as this.

3.5 National and international utilization

Domestic and international trade has been the driving force behind depletion of populations in the North Atlantic and may potentially also threaten southern hemisphere populations. Porbeagle are one of relatively few shark species targeted for their meat, with target fisheries still operating in Canada and France and short-term opportunistic target fisheries in other States as and when aggregations are located. Porbeagle shark products include fresh, frozen and dried-salted meat for human consumption, oil and fishmeal for fertilizer, and fins for shark-fin soup (Compagno 2001). Despite the high value of its meat trade in *L. nasus* is not documented at species level. This makes it difficult to assess the importance and scale of its utilisation worldwide. The species is also utilised for sport fishing in Ireland, the United States and the United Kingdom (FAO FIGIS 2006), with catches either retained for meat and/or trophies, or tagged and released (DFO 2001).

Low levels of *L. nasus* are also taken by game fishers off the South Island of New Zealand (Big Game Fishing Council, undated).

Porbeagles may also be utilised nationally in some range States for their liver oil, cartilage and skin (Vannuccini 1999). Low-value parts of the carcass may be processed into fishmeal. There is limited utilisation of jaws and teeth as marine curios. No significant national use of *L. nasus* parts and derivatives has been reported, partly perhaps because records at species level are not readily available, and partly because landings are now so small, particularly in comparison with other species. Porbeagle hides have been processed into leather and liver oil extracted (Vannuccini 1999, Fischer *et al*. 1987), but trade records are not kept. Cartilage is probably also processed and traded. Other shark parts are used in the production of fishmeal, which is probably not a significant product from *L. nasus* fisheries because of the high value of the species' meat (Vannuccini 1999).

The large size of *L. nasus* fins means that these are a relatively high value product. They have been identified in the fin trade in Hong Kong and are one of six species frequently utilised in the global fin market (including makos, blue, dusky and silky sharks (Shivji *et al*. 2002)).

4 Protection status and needs

4.1 National protection status

Sweden prohibits the fishing and landing of porbeagle sharks. Norway has adopted ICES advice by prohibiting target fisheries for *Lamna nasus* in Norwegian waters and ICES divisions I–XIV (bycaught fish must be landed). Canada allows a small, directed fishery regulated under a total allowable catch (TAC) limit. In mid 2008, the USA will reduce its annual Atlantic, commercial porbeagle quota from 92t to 1.7t, while allotting 9.5t for commercial discards and 0.1t for recreational catches. The North American limits are intended to rebuild the population within 100 years, based on the Canadian assessment. Canada's Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2004) expressed concern that, although the quota for 2002–2007 of 200–250t represents a substantial reduction from catches in the mid-1990s, even this amount now corresponds to a high exploitation rate because of the low population abundance and may not be sufficient to halt the *L. nasus* decline or to enable the population to recover. The Committee On the Status of Endangered Wildlife In Canada (COSEWIC) recommended that porbeagle sharks be protected as endangered species under the country's Species at Risk Act, but their advice was not heeded. New Zealand introduced quota management for porbeagle in 2004. In the Northeast Atlantic, the conservation and management of sharks in waters under the sovereignty or the jurisdiction of Member States of the European Community falls within the domain of the European Common Fishery Policy (CFP). Proposals by the European Commission for establishing porbeagle TAC under the CFP need to be approved by Member States in the Council of the European Union. EC Regulation 40/2008 allotted quota shares of a new, 2008 EC porbeagle TAC (581 tn in EC and international waters of the the Northeast Atlantic) to France, Spain, Denmark, Portugal, Ireland, Germany, UK and Sweden. In addition a few States adopted domestic fisheries management measures. They have not yet delivered sustainable harvest of *L. nasus*. In addition, EC Regulation 1185/2003 prohibits shark "finning" (the removal of shark fins and subsequent discarding of the body) of this and other shark species, and subsequent discarding of the body. This regulation is binding on EC vessels in all waters and non-EC vessels in Community waters.

4.2 International protection status

'Family Isurida' (now Lamnidae, including *L. nasus*) is listed on Annex 1 (Highly Migratory Species) of the UN Convention on the Law of the Sea (UNCLOS). The UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks, in force since 2001, establishes rules and conservation measures for high seas fisheries resources. It directs States to pursue cooperation in relation to listed species through appropriate sub-regional fisheries management organisations or arrangements, but there has not yet been any progress with implementation of oceanic shark fisheries management.

The International Plan of Action (IPOA) for the Conservation and Management of Sharks urges all States with shark fisheries to implement conservation and management plans. However, this initiative is voluntary and fewer than 20 States have produced Shark Assessment Reports or Shark Plans. Some RFOs have recently adopted shark resolutions to support improved recording or management of pelagic sharks taken as bycatch in the fisheries they manage, but no management is yet underway.

Lamna nasus is listed on Annex III, 'Species whose exploitation is regulated' of the Barcelona Convention Protocol concerning specially protected areas and biological diversity in the Mediterranean, signed in 1995 but not yet ratified (Anon. 2002). The Mediterranean population was also added in 1997 to Appendix III of the Bern Convention (the Convention on the Conservation of European Wildlife and Natural Habitats) as a species whose exploitation must be regulated in order to keep its population out of danger. No management action has yet followed these listings.

4.2.1 Atlantic

In 2004, the International Commission for the Conservation of Atlantic Tunas (ICCAT) adopted a binding Recommendation to ban shark finning and promote the collection of shark fisheries data. In 2007, ICCAT passed a binding Recommendation for countries without peer-reviewed stock assessments (currently all countries but Canada) to reduce fishing mortality on *L. nasus*. Measures to achieve this goal have been left up to individual country members and the EC. Also in 2007, ICCAT directed its scientists to review the population status of porbeagle sharks and report back to the Commission with management recommendations by 2009. ICCAT scientists may well complete this task in 2008 as a major shark population assessment meeting is planned for September 2008.

4.2.2 Southern hemisphere

The Western and Central Pacific Fisheries Commission (WCPFC) will be responsible for pelagic shark management, but this is unlikely to be attempted during the early years of this Commission (Ministry of Fisheries 2006). WCPFC has banned shark finning (except for vessels under 24 meters). CCAMLR appears not to be specifically monitoring or managing porbeagle sharks, but in 2006 banned targeted shark fishing at least until populations can be assessed and sustainable limits determined.

4.3 Additional protection needs

ICES (2005) recommended: "Given the apparent depleted state of this stock, no fishery should be permitted on this stock" and has since reiterated this advice. The European Scientific, Technical and Economic Committee on Fisheries (STECF 2006) recommended "that no directed fishing be allowed, while other measures be taken to prevent bycatch of porbeagles in other fisheries." ICES has noted that mandatory release may be an effective means to achieve the

latter, as most porbeagles are "captured" (come to the boat) alive.

The CMS Scientific Council agreed in March 2007 following consideration of a taxonomic review prepared by the IUCN SSC Shark Specialist Group (2007) that this threatened migratory species meets the criteria for listing on the Appendices and should be considered by the Conference of Parties to CMS in December 2008.

The inclusion of *Lamna nasus* in Appendix II of the CMS convention would highlight the urgency for effectively restricting mortality of the species and facilitate coherency among the broad range of management options.

Successful engagement of CMS in migratory shark conservation requires consultation and engagement with FAO, RFMOs (regional fisheries management organisations) and CMS Party Fisheries Departments. If such consultation is undertaken and opportunities are pursued for developing synergies between these two schools of living natural resource management, then there is considerable potential for CMS to focus needed attention on this particularly vulnerable and under-protected species and prompt improvement in the fisheries management measures.

Lamna nasus would benefit from conservation attention from CMS and its partners. As the greatest threat to shark stocks arise from overfishing through target and bycatch fisheries, it follows that CMS may have greatest impact if it is able to promote higher priority for porbeagle shark conservation and develop measures that complement and strengthen existing fisheries management initiatives, for example by identifying and addressing the gaps left by the implementation of traditional fisheries measures and the potential for synergistic efforts.

Summary**:**

The large warm-blooded porbeagle shark (*Lamna nasus*) occurs in temperate North Atlantic and southern ocean waters. It is relatively slow growing, late maturing, and long-lived, bears small litters of pups and has a generation period of 20–50 years and an intrinsic rate of population increase of 5-7% per annum. It is therefore highly vulnerable to over-exploitation from fisheries.

Lamna nasus meat is high quality and high value. Its large fins are valuable. It is taken in target fisheries and is also an important retained and utilised component of the bycatch in pelagic longline fisheries. Unsustainable North Atlantic target *Lamna nasus* fisheries are well documented. These depleted stocks severely; landings fell from thousands of tonnes to a few hundreds in under 50 years. Very few data are available for southern hemisphere stocks, which are a high value target and bycatch of longline fisheries, but those data that are available show declining trends. Northwest Atlantic stock assessments document a decline in stock biomass to 11–17%, total abundance to 21–24% and numbers of mature females to 12–15% of virgin levels. Management since 2002 has maintained a relatively stable population, but with a slight decline in mature females. There is no stock assessment for the more heavily fishedand possibly more seriously depleted Northeast Atlantic and Mediterranean population, or for southern stocks. Whereas ICCAT has encouraged conservation and requested scientific advice for porbeagles and it will undertake a stock assessment of sharks, including porbeagle, in September 2008, no RFMOs are actively managing porbeagle stocks.

An Appendix-II listing is proposed for *Lamna nasus*. The North Atlantic stocks have experienced marked historic and recent declines. Management in the Northwest Atlantic has stabilized the population but recovery is estimated to take 100 years and may not have begun. It falls into FAO's lowest productivity category of the most vulnerable species: those with an intrinsic rate of

population increase of <0.14 and a generation time of >10 years (FAO 2001) and the extent and rate of population declines have exceeded the recommended qualifying levels for listing.

The purpose of an Appendix-II listing for *Lamna nasus* is to prompt and facilitate focused, enhanced international cooperation among Parties and relevant international organisations, in order to ensure that porbeagle mortality is limited to levels that prevent population collapse and allow for rebuilding and sustainable fishing.. Enhanced international cooperation will complement and reinforce traditional fisheries management measures, thus also contributing to implementation of the UN FAO International Plan of Action for the Conservation and Management of Sharks.

5. Range States[1]

ALBANIA, ALGERIA, Antarctica, ARGENTINA, AUSTRALIA (New South Wales; Queensland; South AUSTRALIA; Tasmania; Victoria; Western, AUSTRALIA), Azores Islands (PORTUGAL), BELGIUM, Bermuda (UNITED KINGDOM), Bosnia and Herzegovina, Brazil, Canada (New Brunswick; Newfoundland; Nova Scotia; Prince Edward Island), Canary Islands (SPAIN), CAPE VERDE, Channel Islands (UNITED KINGDOM), CHILE CROATIA, CYPRUS, DENMARK, EGYPT, Faeroe Islands (DENMARK), Falkland Islands (Malvinas), FINLAND, FRANCE (including Corsica), French Polynesia (FRANCE), GERMANY, Gibraltar, GREECE (East Aegean Islands; Kriti), Greenland (DENMARK), Iceland, IRELAND, Isle of Man , (UNITED KINGDOM), ISRAEL, ITALY (including Sardinia and, Sicily), Kerguelen Islands (FRANCE), Lebanon, LIBYAN ARAB JAMAHIRIYA, Madeira Islands (PORTUGAL), MALTA, MONACO, MOROCCO, Montenegro, NETHERLANDS, NEW ZEALAND, NORWAY, PORTUGAL, Russian Federation, SLOVENIA, SOUTH AFRICA, South Georgia and the South Sandwich Islands, SPAIN, SWEDEN, SYRIAN ARAB REPUBLIC, TUNISIA, Turkey, UNITED KINGDOM (England,, Wales, Scotland, Northern, Ireland), United States (Maine; Massachusetts; New Jersey; New York; Rhode Island; South Carolinas?), URUGUAY.

FAO Fisheries Areas:
21, 27, 31, 34, 37, 41, 47, 48, 51, 57, 58, 81 and 87.

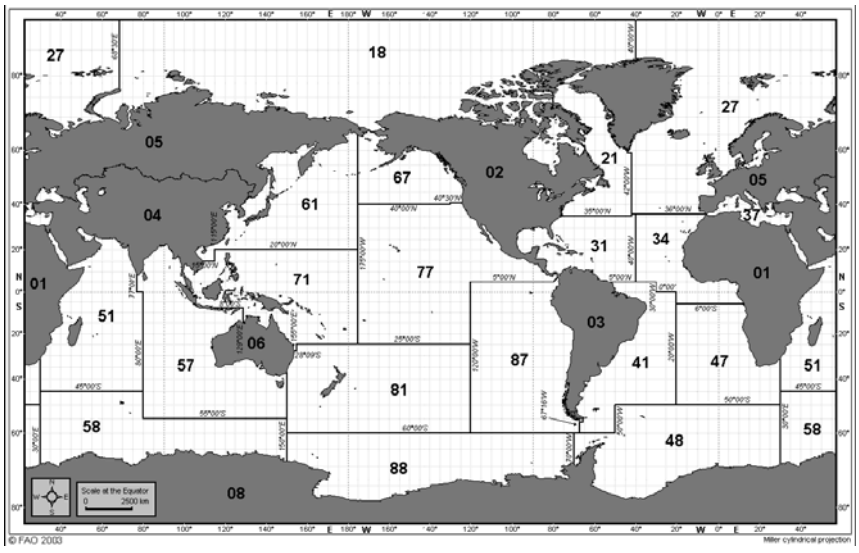

Figure 4. FAO fishing areas.

[1] CMS Parties in capitals.

6. Comments from Range States

In the context of the proposal for inclusion of this species in Appendix I and II of the CITES convention, Range States and other bodies were consulted twice in 2006. Responses were received from Albania, Argentina, Australia, Austria, Bulgaria, Canada, China, Cuba, Croatia, the Czech Republic, Estonia, the Faeroe Islands (Denmark), Finland, France, Georgia, who had offered to support the proposal as co-sponsor, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Madagascar, Monaco, Morocco, New Zealand, Norway, Poland, Romania, the Republic of Korea, the Russian Federation, Serbia, Spain, Turkey, the United Kingdom, Uruguay and the United States; also from the European Commission, the International Council for the Exploration of the Seas (ICES), International Scientific Committee for Tuna and Tuna-like Species in the Pacific Ocean (ISC), Northwest Atlantic Fisheries Organization (NAFO), Ocean Conservancy and the UNEP Mediterranean Regional Activity Centre for Specially Protected Areas (RAC/SPA).

No additional inquiries were made in preparation of this document.

7. Additional remarks

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

A. PROPOSAL: Inclusion of *Squalus acanthias* Linnaeus, 1758 on Appendix II

B. PROPONENT: European Community and its Member States

C. SUPPORTING STATEMENT:

1. Taxon

	Kingdom:	Animalia
	Phylum:	Chordata
1.1	**Classis**:	Chondrichthyes, subclass Elasmobranchii
1.4	**Ordo**:	Squaliformes
1.5	**Familia**:	Squalidae
1.6	**Species**:	*Squalus acanthias* Linnaeus, 1758
1.7	**Common name(s)**:	**E**nglish: spiny dogfish, spurdog, piked dogfish **F**rench: aiguillat commun **S**panish: mielga, galludos, cazón espinozo, tiburón espinozo, espineto, espinillo, tollo, tollo de cachos **D**utch: doornhaai; **Da**nish: pighaj; **G**erman: Dornhai; **I**talian: spinarolo

2. Biological data

The spiny dogfish (*Squalus acanthias, figure 1*) is a small, temperate-water, migratory shark of shelf seas in the northern and southern hemispheres. Although naturally abundant, it is one of the more vulnerable species of shark to over-exploitation by fisheries because of its late maturity, low reproductive capacity, longevity, long generation time (25–40 years) and hence a very low intrinsic rate of population increase (2–7% *per annum*). These life history parameters (Table 1) result in a limited reproductive capacity and one of the lowest population growth rates calculated for any shark species. Smith *et al*. (1998) considered this species to have the lowest intrinsic rebound potential of 26 shark species analysed, at 2.3% annual rate of population increase from maximum sustainable yield (MSY) in the Northeast Pacific, compared with 4–7% in the Northeast Atlantic (Heessen 2003). Annual mortality is estimated as 0.092 in the Northwest Atlantic (NFSC 2003), or around 0.1, increasing to 0.3 for very old or young fish (ICES WGEF 2006).

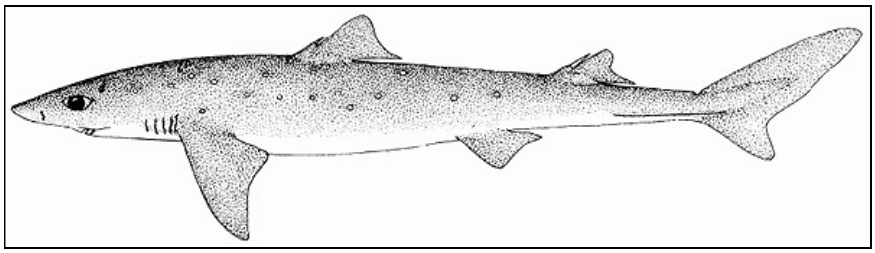

Figure 1: Spiny dogfish *Squalus acanthias*

(Source: FAO FIGIS 2003)

Age at maturity (years)	female:	12 (NW Atlantic); 23 (NE Pacific); 15 (NE Atlantic)
	male:	6 (NW Atlantic)/ 14 (NE Pacific)
Size at maturity (total length cm)	female:	75 (NWA); 93.5 (NEP); 83 (NEA); 70–100 (Mediterranean)
	male:	60 (NW Atlantic); 59 (Australia); 59–72 (Mediterranean)
Longevity (years)	female:	40–50 (NW Atlantic), >60 yrs (NW Pacific), or up to 100 years
	male:	35 (NW Atlantic)
Maximum size (total length cm)	female:	110–124 (N Atlantic); 130–160 (N Pacific); 200 (Med), 111 (NZ)
	male:	83–100 (N Atlantic); 100–107 (N Pacific); 90 (NZ)
Size at birth (cm)		18–33
Average reproductive age *		Unknown, but over 25 years; ~40 years in NE Pacific.
Gestation time		18–22 months
Reproductive periodicity		Biennial (no resting stage, litters are born every two years)
Average litter size		1–20 pups (2–15 NW Atlantic, 2–11 Med), increases with size of female
Annual rate of population Increase		2.3 % (N. Pacific); 4–7% (NE Atlantic)
Natural mortality		0.092 (NW Atlantic), 0.1 (0.3 for very old/young fish) (NE Atlantic)

Table 1 life history parameters of the spiny dogfish (*Squalus acanthias* Linnaeus, 1758)

2.1 Distribution

Squalus acanthias occurs in northern and southern temperate and boreal waters of 7–8°C to 12–15°C (figure 2) and has been recorded in the range States and FAO Areas listed under point 5. It is most common in coastal waters (10–200m) and fished inside 200-nautical mile Exclusive Economic Zones. Although some stocks undertake long distance seasonal migrations (e.g. NFSC 2003, Hanchet 1988), even crossing ocean basins (Templeman 1954, 1984), its distribution is fragmented into distinct populations separated by deep ocean-tropical waters, or polar regions. Genetic exchange across the Atlantic is considered very limited (Hammond and Ellis 2005). The principal populations occur in the Northwest and Northeast Atlantic (including Mediterranean and Black Seas), Northeast and Northwest Pacific (including Sea of Japan), South Atlantic and Southeast Pacific off South America, and New Zealand, with smaller populations off South Africa and southern Australia.

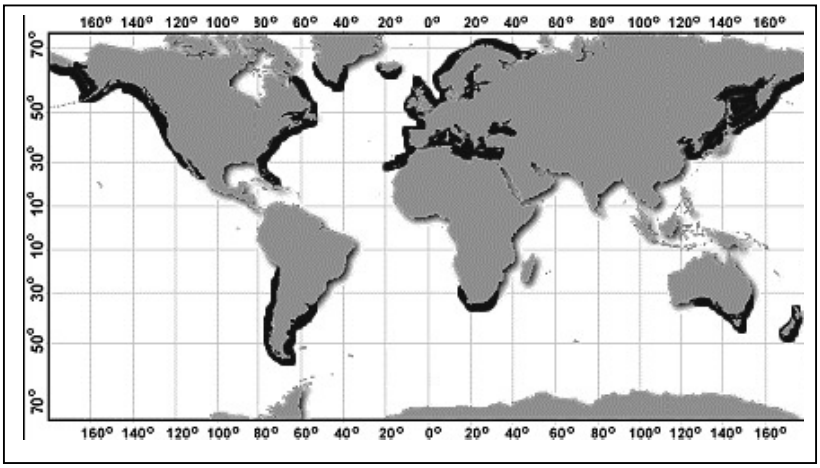

Figure 1. Global *Squalus acanthias* Spiny Dogfish distribution (Source: FAO 2003)

2.2 Population

The **Northeast Atlantic** *S. acanthias* population size has been estimated, at between 500,000 and 100,000 mature individuals in 2000, following a roughly 80% decline from 1980 (Annex 1 Figure 2, Heessen 2003 – Annex 1 Figure 3). In 2005, ICES advised: 'The stock is depleted and may be in danger of collapse. Target fisheries should not be permitted to continue, and by-catch in mixed fisheries should be reduced to the lowest possible level. Also in 2005, the ICES Advisory Committee on Fisheries Management (ACFM 2005) reported: "All experimental assessments indicate that the stock is at a record low level. Frequency of occurrence of spurdog in trawl surveys has declined and although large shoals are still caught, the frequency of these has declined. The level of exploitation is unknown, but the continuous decline in landings indicates that fishing mortality has been, and continues to be well above sustainable levels." All analyses presented in reports by the ICES Working Group on Elasmobranch Fisheries (WGEF) have indicated that the NE Atlantic stock has been declining rapidly and is at its lowest ever level. Preliminary assessments making use of the long time-series of commercial landings data suggest that this decline has been going on over a long period of time and that the current stock size may only be a small fraction of its virgin biomass (< 10%). The IUCN Red List assessment for the Northeast Atlantic is **Critically Endangered** (Fordham *et al*. 2006).

Canadian surveys in the Northwest Atlantic (Wallace *et al*. 2006) have produced mature female population size estimates for the Scotian Shelf (Nova Scotia, Atlantic Canada) stable at around 3.5 million (less than 3% of the whole population), but a rapid decline to about 78,000 mature females in 2004 on Georges Bank (a stock shared by the United States of America and Canada), and a reduction in distribution and abundance in the Gulf of Saint Lawrence. In 2006, National Marine Fisheries Service (NMFS) reported some rebuilding in the mature female portion of the Northwest Atlantic population (previously depleted by 75% by targeted fisheries), but continuing poor recruitment, decreased pup survival, declining immature female biomass and mature female size, and a skewed sex ratio (strongly favoring males) leaves cause for concern; complete rebuilding of the population is expected to take decades. The IUCN Red List categorises Northwest Atlantic *S. acanthias* as **Endangered**, on the basis of reductions in population size exceeding 50% (Fordham *et al*. 2006).

Squalus acanthias is very rare in the western **Mediterranean**, but regularly recorded in the eastern basin. The IUCN Red List assessments for Mediterranean and **Black Sea** *S. acanthias* populations are **Endangered, and Vulnerable** respectively (Fordham *et al*. 2006).

In the **Western North Pacific**, Sea of Japan, *S. acanthias* have been fully exploited since before 1897. There appears to have been a rapid decline in stocks after Japanese catches peaked at ~60,000t in 1952 and another decline after the 1970s.Catches had fallen to ~1000t by 1993 and continued to decline to an average of 458t in recent years (Fisheries Agency of Japan 2004). The current stock level is low and the trend decreasing. The IUCN Red List categorises this stock as at least **Endangered**, noting that it may prove to be Critically Endangered once a full regional review can be undertaken (Fordham *et al*. 2006).

Former intensive fisheries for *S. acanthias* in the **Northeast Pacific** apparently collapsed in 1910 and in the late 1940s. This stock has since recovered under low exploitation pressures in most of its range. The current IUCN Red List categorises Northeast Pacific *S. acanthias* as **Vulnerable**, on the basis of an estimated reduction in population size greater than 30% (Fordham *et al*. 2006).

Squalus acanthias has long been a common bycatch species in demersal fisheries in the **South American** region, but until recently was primarily discarded (Cousseau and Perrota 2000, Cañete *et al*. 1999). Commercial targeting of *S. acanthias* probably commenced around 2001. Landings are not, however, recorded by species or even by genus, but combined in categories that include these other small sharks, seriously hampering analysis of trends. With rising market demand in Europe, it is likely that this species will increasingly be targeted on the south-eastern coast of South America (Uruguay and Argentina), where other stocks are in decline while demand and fishing effort are increasing (e.g. Van Der Molen *et al*.1998). The IUCN Red List categorises South American stocks of *S. acanthias* as **Vulnerable**, based on an estimated ongoing reduction in population size greater than 30% (Fordham *et al*. 2006).

Domestic demand for *S. acanthias* meat is low in **Australia** (Last and Stevens 1994). *S. acanthias* were introduced to the **New Zealand** Quota Management System in October 2004 with a TACC (Total Allowable Commercial Catch) of 12,660t. Catches remain below this level (Ministry of Fisheries 2006). Catch rate analyses and trawl survey biomass indices are largely stable or increasing (Manning *et al*. 2004, Sullivan *et al*. 2005, Ministry of Fisheries 2006). Spiny dogfish are not targeted commercially by **South African** fishermen. Australasian and South African stocks of *S. acanthias* are **Least Concern** on the IUCN Red List (Fordham *et al*. 2006).

2.3 Habitat

This is a continental shelf species, occurring from the intertidal to the shelf slope. *S. acanthias* are usually found swimming in large schools just above the seabed, but also move throughout the water column on the continental shelf. They have unusually been recorded to depths of 900m (Compagno 1984), but are most common from 10–200m (McEachran and Branstetter 1989). Segregation by size and sex makes schools of large pregnant females particularly vulnerable to fisheries (Compagno 1984).

2.4 Migrations

Squalus acanthias make latitudinal and depth migrations to stay within their optimum water temperature range (7-15°C) (Compagno in prep.). Although some stocks undertake long distance seasonal migrations (e.g. NEFSC 2003, Hanchet 1988), even crossing ocean basins (Templeman 1954, 1984), its distribution is fragmented into distinct populations separated by deep ocean, tropical waters, or polar regions. Extensive horizontal migrations (of up to 7000km) have, however, been recorded during tagging studies in the North Pacific Ocean (McFarlane and King 2003).

Tagging studies have been conducted off the UK since the late 1950s. Fish tagged off Scotland were regularly recaptured off the Norwegian coast (Aasen 1960, Hammond and Ellis 2005), suggesting that these sharks migrate in winter from Scotland to Norway, with a return migration in summer (Aasen 1962, Hammond and Ellis 2005). There were also some recaptures from outside the area: the Barents Sea and west of Ireland, southern North Sea, English Channel and northern Bay of Biscay (Hammond and Ellis 2005). Although the majority of returned fish were from Scottish and Norwegian waters, this may be the result of spatial differences in fishing activity, as Scottish and Norwegian waters were the major fishing grounds (Hammond and Ellis 2005). Fewer studies have been conducted south of the UK, but fish tagged and released in the Irish Sea were recaptured from northern Scotland to the Celtic Sea and fish tagged in the Celtic Sea were recaptured all around the UK (Hammond and Ellis 2005). Changes in the migration

pattern of spiny dogfish in the North Sea have also been reported (Hjertenes 1980). Transatlantic migrations have occurred, but these are infrequent, and genetic exchange across the Atlantic is considered very limited (Hammond and Ellis 2005).

Mating and breeding migrations in New Zealand are described by Hanchet (1988) and Ministry of Fisheries (2006). Off New Zealand pregnant females migrate from deeper water to inshore waters, and then return to deepwater to give birth and mate (Compagno in prep).

2.5 Movement between international borders

About 71,000 spiny dogfish were tagged off the west coast of Canada from 1978 to 1988 (McFarlane and King 2003). This study showed that, aside from seasonal movements, male and female spiny dogfish of all sizes migrate considerably farther than suggested by previous studies. Some tagged spiny dogfish released between 1980 and 1987 in open coastal waters off the west coast of Vancouver Island, and northern British Columbia undertook extensive migrations, with recaptures throughout the North Pacific, from Japan, through Alaska, south to Mexico. Substantial movement from Vancouver Island, Canada, south to Washington State, USA, waters was also recorded. Although the significance of such east to west exchanges is not known, they do provide evidence for trans-Pacific connection of spiny dogfish (McFarlane and King 2003).

Tagging studies off the UK suggest that stocks of spiny dogfish undertake separate winter migrations to the Irish Sea and the Norwegian coast, returning in summer to mix off the northwest of the UK (Compagno in prep, Holden 1962).

In the Northwest Atlantic, *S. acanthias* migrates from deep water off the middle of the US and southern States in spring, travelling northwards along the coasts of Newfoundland and Labrador, Canada, as well as southwards along the US Atlantic coast, sometimes to Cuba (Bigelow and Schroeder 1953, Compagno in prep).

3 Threat data

3.1 Direct threats to the population

The principal direct threat to *S.acanthias* worldwide is **over-exploitation** through targeted fisheries and bycatch. This is a valuable commercial species in many parts of the world, caught by commercial fisheries using bottom trawls, gillnets, line gear, and by sport fishermen using rod and reel. Of particular concern is practice of commercial targeting reproductive females (the largest and most valuable individuals) facilitated by the species' tendency to school by size and sex. Spiny dogfish are also caught as small as 50cm (~4–5 years old) and are therefore exploited before they reach maturity at 74–94cm. This results in a very unnatural population structure in heavily fished stocks, with low mature female biomass and skewed sex ratios The removal of the largest females also causes greatly reduced pup production (small, recently mature females bear small litters of small pups with low survival rates) (NEFSC 2003). In most cases, spiny dogfish catches are not restricted to levels advised by scientists.

Because *S. acanthias* occurs in many areas where gill nets, longlines and trawls are used, **bycatch** in these gears affects its stocks, but is often unreported and not included in national fisheries statistics. Those with small mesh size may kill young individuals, which will not reach the retail

market and may not appear in catch records if discarded (NEFSC 2003, Anon. 2003, Bundy 2003). For example, the deepwater bottom trawl fishery for *Nephrops* and shrimps along the south coast of Portugal has large *S. acanthias* discards (European Parliament 1999). In the Southwest Atlantic, a study undertaken in Argentina and Uruguay estimated that the abundance of *S. acanthias* populations dropped following the intensification of fishing activities on other species (Massa *et al*. 2002). NFSC (2003) noted the high levels of by-catch in the Northwest Atlantic, estimating that the mean of discards (16,700t) was more than double that of reported landings in the United States (7200t). The authors stressed, however, that discards have a smaller impact upon stock status because they affect all size classes, while landings primarily impact mature females, which are the most vulnerable and important component of the population.

3.2 Habitat destruction

Coastal development, pollution, dredging and bottom trawling affect the coastal or benthic habitats on which *S. acanthias* and their prey are dependent (ASMFC 2002). Such environmental threats may have potential impacts on *S. acanthias* stocks associated with areas of habitat degradation and loss.

3.3 Indirect threat

Because of their tendency to form large schools, take bait intended for other species, and be of relatively low value, commercial and recreational fishermen may intentional kill *S.acanthias* taken as bycatch. Reports of this practice, usually through spiking the brain or snapping the spine, are particularly common along the U.S. east coast.

3.4 Threat connected especially with migrations

S. acanthias is a migratory species that usually strongly segregates by age and by sex. Their aggregating habit makes it easy for fishermen to continue to obtain good catches from a seriously depleted stock, and to target the most valuable part of the stock (large, usually pregnant females) as they undertake predictable seasonal migrations through fishing grounds. Management is in place in only a few range states, often for only a limited part of the range of highly migratory stocks, and is generally not in line with scientific advice. For the most part, countries limiting spiny dogfish fisheries do not coordinate their management programs for shared populations. Evidence from tagging studies shows that this species moves across state borders and uncoordinated regulation is ineffective for conserving a highly migratory species.

3.5 National and international utilization

Compared to most other shark species, catch and trade in *S. acanthias* are relatively well documented. This is due to its long history of domestic and international utilization. This is by far the most important shark species landed commercially in the Northeast Atlantic, where it has been of considerable importance to fisheries for 70 years.

Widely utilized for its flesh, particularly valued for human consumption in Europe, its liver oil and fins are also consumed. Some former fisheries were driven mainly by the demand for oil, until synthetic vitamin A became available and this market collapsed. Despite low quality, *S. acanthias* fins have been routinely traded in East Asia (for shark fin soup) for at least the two last decades of the 20th century (Rose 1996). Cartilage and hides are also utilised, and landings used to

produce fishmeal and fertiliser if markets for human consumption are not available (Compagno 1984). They have also been utilized locally as scientific specimens for teaching purposes.

Spiny dogfish **meat**, derived from commercial target fisheries and landed bycatch, is eaten in Europe, Japan, South America and, to a lesser extent, in New Zealand and Australia (where it is considered coarse). It is consumed fresh, frozen or smoked. Markets favour mature females due to their larger size. In the United Kingdom, *S. acanthias* is known as "rock salmon," "huss" or "huss tail") and used mainly in fish and chips. In Germany, meat is sold as "See-Aal" (sea eel) and belly flaps are smoked to make *Schillerlocken* (Rose 1996). In France, fresh meat is sold as *aiguillat commun* or *saumonette d'aiguillat.* In the 1990s, industry groups in the northeast of the United States campaigned to create domestic demand for *S. acanthias* under the more palatable name "cape shark" (Fordham 2005) and this, together with promotional activity by seafood associations, has resulted in an increase in the acceptability of dogfish on the market of the United States.

While *S. acanthias* no longer retain their historical importance as a source of valuable **liver oil** for lighting and vitamin A, the oil is still utilised to some extent, likely mixed with that of other shark species. **Fins** may be utilised nationally in Japan but are of relatively low value because of their small size. The possible use of other parts and derivatives of *S. acanthias*, such as cartilage, leather or curios (teeth or jaws) is not well documented or officially recorded and, if it occurs, it is of negligible importance compared with the utilisation of meat. Although more common in the past, Spanish fishermen still use sharkskin to polish and sand their boats (Rose 1996). *Squalus* heads are used as bait for other fisheries, in Morocco for instance (Fischer *et al*. 1987). An assessment by the United States of the importance of recreational fishing for *S. acanthias* concluded that this became a significant proportion of total landings from 2001 (NFSC 2003).

There are no global trade data available for *S. acanthias*. FAO trade data includes the species in its various generic shark trade groupings. The bulk of the trade in *S. acanthias* is included in the categories 'Dogfish (Squalidae) fresh or chilled' and 'Dogfish (Squalidae) frozen'. However the data reported in these categories would contain data for species other than *S. acanthias2* and are not meaningful for this analysis.

Of the countries known to have exported spiny dogfish product to the EU over the last decade (Table 5) four of the top eight suppliers (Morocco, Argentina, Iceland and Mauritania) are not recorded by FAO as catching *S. acanthias*. In some cases, this can be explained at least partly by poor identification and recording at the point of capture, which results in landings data not being recorded at the species level. Since foreign markets are in most cases the driving economic force behind *S. acanthias* fisheries around the world (see 6.2), unregulated international trade into European States is the main threat to inadequately managed populations. The lack of adequate management of *S. acanthias* stocks in the majority of range States, coupled with the long established market demand for its products, has led to a direct impact on this species' populations. Fisheries that formerly caught *S. acanthias* as by-catch and largely discarded it are now moving towards landing and exporting its valuable products, likely driving further stock depletions.

4 Protection status and needs

4.1 National protection status

National biodiversity legislation is not known to be in force for the purposes of conserving *S. acanthias* or its habitats, nor for the purpose of trade regulation.

In recent years, EU spurdog TACs have been limited to bycatch only; spurdog catch thereby cannot exceed 5% of the live weight of fish onboard a vessel. ICES has recommended one TAC of zero for all ICES areas.

EC Regulation 1185/2003 prohibits shark "finning" (the removal of shark fins and subsequent discarding of the body). This regulation is binding on EC vessels in all waters and non-EC vessels in Community waters.

In Atlantic Canada, increasing landings led to the introduction of quotas that capped and allocated catches and bycatch at historic levels, pending investigation of sustainable exploitation levels. There is currently a quota for fixed gear licenses and scientific sampling, and small quotas for each trawl vessel. (Bundy 2003).

U.S. federal and state agencies restrict catches of *S. acanthias*, but attempts to coordinate management have been largely unsuccessful,. The first US Atlantic management plan, developed by the Mid-Atlantic and New England Fishery Management Councils in response to a decade of intense unregulated fishing (Bonfil 1999), took effect in 2000. NMFS has imposed low, science-based trip limits and quotas ever since, but federal management measures are not compulsory in state waters where directed fishing continued, particularly off Massachusetts.

Stocks of the west coast of the United States are minimally managed despite increasing interest in fisheries off Alaska and Washington State. Federal management of *S. acanthias* fisheries in the North Pacific of United States commenced in 2006 with trip limits pending stock assessment (possibly in 2007) and development of quotas. Off Alaska, they are regulated under an "other species" TAC (Alaska NMFS report 2000). Washington State includes *S. acanthias* in bottomfish management plans, but there are few species-specific measures. The directed fishery is subject to mesh restrictions but not quotas and a pupping ground has been closed to fisheries.

The Canadian Pacific quota, 2–3 times higher than recent catches, is based on a stock assessment undertaken in 1987 (Wallace *et al*. in prep.).

New Zealand has included *S. acanthias* in its Quota Management System (QMS) since 2004.

Japan monitors shark stocks and will recommend, when necessary, the introduction of measures for the conservation and management of shark resources (Japanese Fisheries Agency 2003). There are no spiny dogfish restrictions imposed by Asian countries.

Norway restricts its *S. acanthias* fishery with a minimum landing size intended to enable sharks to mature before capture. This is of limited value as it is not coupled with science-based limits throughout its range. There is some coordination between spiny dogfish management efforts f Norway and the European Union (discussed below).

4.2 International protection status

There are no international instruments for the conservation of *S. acanthias*; it is not listed on any international wildlife or fisheries agreement and has no international legal status. No efforts have been made to identify and protect critical *S. acanthias* habitat, although some is incidentally protected from disturbance inside in marine protected areas or static gear reserves.

The International Plan of Action (IPOA) for the Conservation and Management of Sharks urges all States with shark fisheries to implement conservation and management plans. However, this is voluntary and relatively few States have produced Shark Assessment Reports or Shark Plans. Some RFMOs have adopted shark resolutions to support improved recording or management of pelagic sharks taken as bycatch in the fisheries that they manage. *S. acanthias* is not pelagic and will not be covered by these measures.

Annex V of the OSPAR Convention on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area requires OSPAR to develop a list of threatened and/or declining species and habitats in need of protection or conservation in the OSPAR maritime area (Northeast Atlantic). Belgium's proposal in 2002 to list *S. acanthias* because of its biological sensitivity and population decline in national waters was not adopted. A new proposal for nomination of *S. acanthias* is expected to be submitted to the next meeting of Parties of OSPAR in June 2008.

4.2.1 Northeast Atlantic

The conservation and management of sharks in EU waters falls under the European Common Fishery Policy (CFP). The European Commission is currently developing a Community Plan of Action for Sharks; the document is not expected to be binding but will rather set the stage for future actions. The first EU Total Allowable Catch (TAC) for *S. acanthias* was established in 1988, but only applied to the North Sea (a small part of the European waters used by this stock), and was based on historic landings, not on scientific advice. Despite regular reductions, the TAC greatly exceeded recent North Sea landings until end 2004, when it was reduced by 74% after only 25% uptake in 2004 and may have become restrictive in this area in 2005.

In 2005, ICES advised: 'The stock is depleted and may be in danger of collapse. Target fisheries should not be permitted to continue, and by-catch in mixed fisheries should be reduced to the lowest possible level. A TAC should cover all areas where spurdog are caught in the northeast Atlantic. This TAC should be set at zero for 2006' (ACFM 2005). A 15% TAC reduction was implemented in the North Sea but no other management measures were introduced.

4.2.2 Northeast Pacific

The United States and Canada conduct cooperative surveys for Northeast Pacific *S. acanthias*, but there is no coordinated, international management for the stock (Camhi 1999).

4.3 Additional protection needs

The CMS Scientific Council agreed in March 2007 following consideration of a taxonomic review prepared by the IUCN SSC Shark Specialist Group (2007) that this threatened migratory species meets the criteria for listing on the Appendices and should be considered by the Conference of Parties to CMS in December 2008.

The inclusion of *Squalus acanthias* in Appendix II of the CMS convention would highlight the urgency for conservation of this particularly vulnerable species and facilitate coherency among currently uncoordinated and inadequate management measures. Listing would also contribute to immediate engagement and cooperation among the fisheries industry, FAO and RFMOs.

Successful engagement of CMS in migratory shark conservation and management depends on consultation and engagement with FAO, RFMOs and CMS Party Fisheries Departments. If such consultation is undertaken and opportunities are pursued for developing synergies between these two schools of living natural resource management, then there is considerable potential for CMS engagement to prompt higher priority for threatened shark species and facilitate improvement of existing conservation programs that appear at present to be inactive or ineffective in most regions.

S. acanthias would benefit from conservation measures delivered through CMS in cooperation with other partners. As the greatest threats to shark stocks arise from target and bycatch fisheries, it follows that CMS may have greatest impact if it is able to complement, promote and enhance the activities of the fisheries management for example by identifying and addressing the gaps left by the implementation of traditional fisheries measures and the potential for synergistic efforts.

Summary**:**

The spiny dogfish (*Squalus acanthias*) is a small, temperate-water, migratory shark of shelf seas in the northern and southern hemispheres. Although naturally abundant, it is exceptionally vulnerable to over-exploitation by fisheries because of its late maturity, low reproductive capacity, longevity, long generation time (25–40 years) and hence a very low intrinsic rate of population increase (2–7% *per annum*). Its aggregating habit makes it vulnerable to fisheries.

S. acanthias fisheries have been documented over many decades. Stock assessments reveal a decline of more than 95% from baseline in the Northeast Atlantic and a 75% reduction in mature females in the Northwest Atlantic in just ten years. Catch per unit effort and landings data indicate that some other stocks may have experienced a range of similar levels of decline. Elsewhere, increased fishing effort during a period of declining fish stocks and rising international market demand infers that other *S. acanthias* stocks are under similar pressure due to international trade demand for their products.

Management is in place in only a few States in a few regions and, in the majority of these, in only a limited part of the species' and not well coordinated across jurisdictional boundaries. In most cases, restrictions have been inadequate to reverse declines and ensure future sustainable fisheries. There is no RFMO management of this species, although ICCAT will be undertaking a stock assessment of sharks in September 2008, which would probably also include spiny dogfish.

The purpose of an Appendix-II listing for *S. acanthias* is to facilitate and promote coherent and effective management measures among the broad range of organizations and measures that address the conservation of this species, and would include cooperation and immediate engagement with the fishing industry, FAO and RFMOs. These measures will complement and reinforce traditional fisheries management measures, thus also contribute to implementation of the UN FAO International Plan of Action for the Conservation and Management of Sharks and the conservation of the species.

5. Range States[1]

ALBANIA, ALGERIA, ANGOLA, ARGENTINA, AUSTRALIA, BELGIUM, Bosnia and Herzegovina, Canada, Canary Islands (SPAIN), CHILE, China, CROATIA, Cuba, CYPRUS, Democratic People's Republic of Korea, DENMARK, EGYPT, Faeroe Islands (DENMARK), Falkland Islands (Islas Malvinas), FINLAND, FRANCE, French Polynesia (FRANCE), Gabon, GEORGIA, GERMANY, GREECE, Greenland (DENMARK), Iceland, IRELAND, ISRAEL, ITALY, Japan, Kerguelen Islands (FRANCE), LATVIA, Lebanon, LIBYAN ARAB JAMAHIRIYA, LITHUANIA, MALTA, MAURITIUS, Mexico, MONACO, Montenegro, MOROCCO, Namibia, NETHERLANDS, NEW ZEALAND, NORWAY, PHILIPPINES?, POLAND, PORTUGAL, Republic of Korea, ROMANIA, Russian Federation, SLOVENIA, SOUTH AFRICA, SPAIN, SWEDEN, SYRIAN ARAB REPUBLIC, TUNISIA, Turkey, UKRAINE, UNITED KINGDOM, URUGUAY, United States (including Alaska), Western Sahara.

FAO Fisheries Areas: 21, 27, 31, 34, 37, 41, 47, 57, 61, 67, 77, 81 and 87 (Annex 1, Figure 1).

6. Comments from Range States

In the context of the proposal for inclusion of this species in Appendix I and II of the CITES convention, Range States and other bodies were consulted twice in 2006. Responses were received from Albania, Argentina, Australia, Austria, Bulgaria, Canada, China, Croatia, Cuba, the Czech Republic, Estonia, the Faeroe Islands (Denmark), Finland, France, Georgia, who had offered to cosponsor the proposal, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Madagascar, Monaco, Morocco, New Zealand, Norway, Poland, the Republic of Korea, Romania, the Russian Federation, Serbia, Spain, Turkey, the United Kingdom, Uruguay and the United States; also from the European Commission as well as the International Council for the Exploration of the Seas (ICES), International Scientific Committee for Tuna and Tuna-like Species in the Pacific Ocean (ISC), Northwest Atlantic Fisheries Organization (NAFO), Ocean Conservancy and the UNEP Mediterranean Regional Activity Centre for Specially Protected Areas (RAC/SPA).

No additional inquiries were made in preparation of this document.

7. Additional remarks

8. References

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[1] CMS Parties in capitals.

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ANNEX1

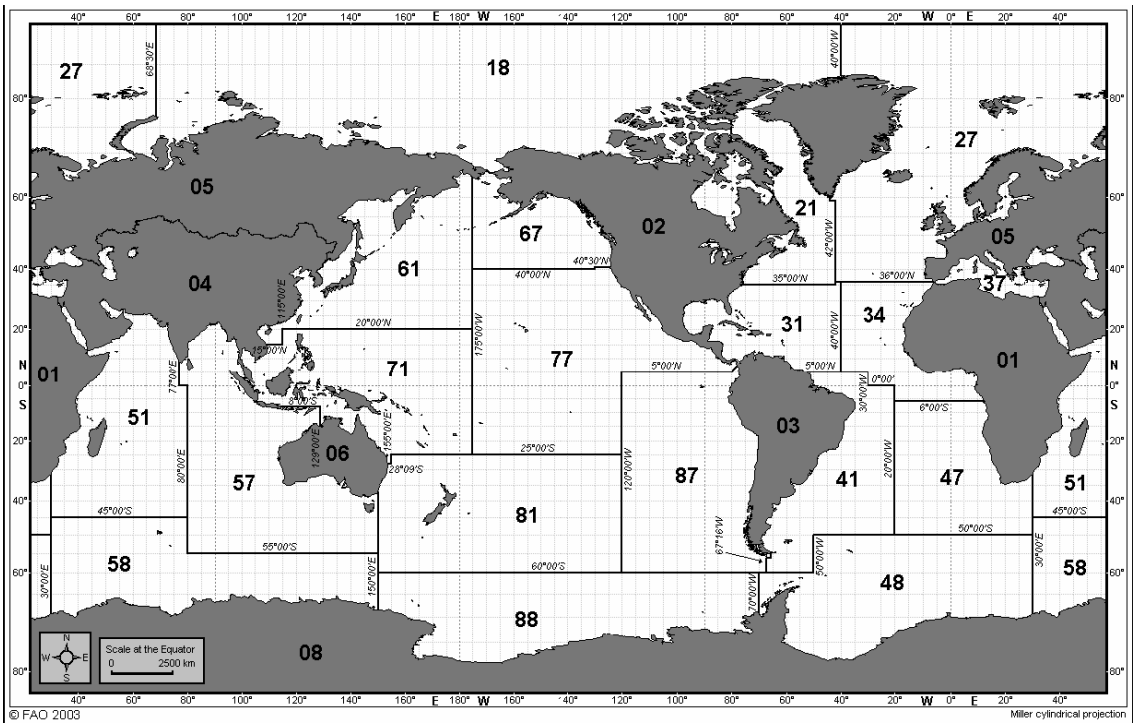

Figure 1. FAO fishing areas.

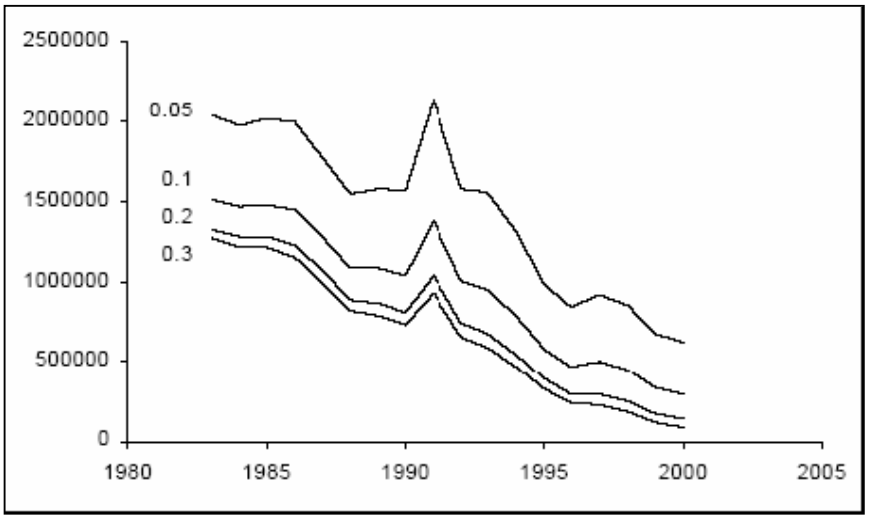

Figure 2. Trends in total population numbers of mature fish in the Northeast Atlantic estimated using a Separable VPA analysis of the catch numbers at age data. Each line represents a different assumption for terminal F (0.05–0.3) on the reference age in the final year.
Source: Figure 6.4.1.14, Heessen 2003.

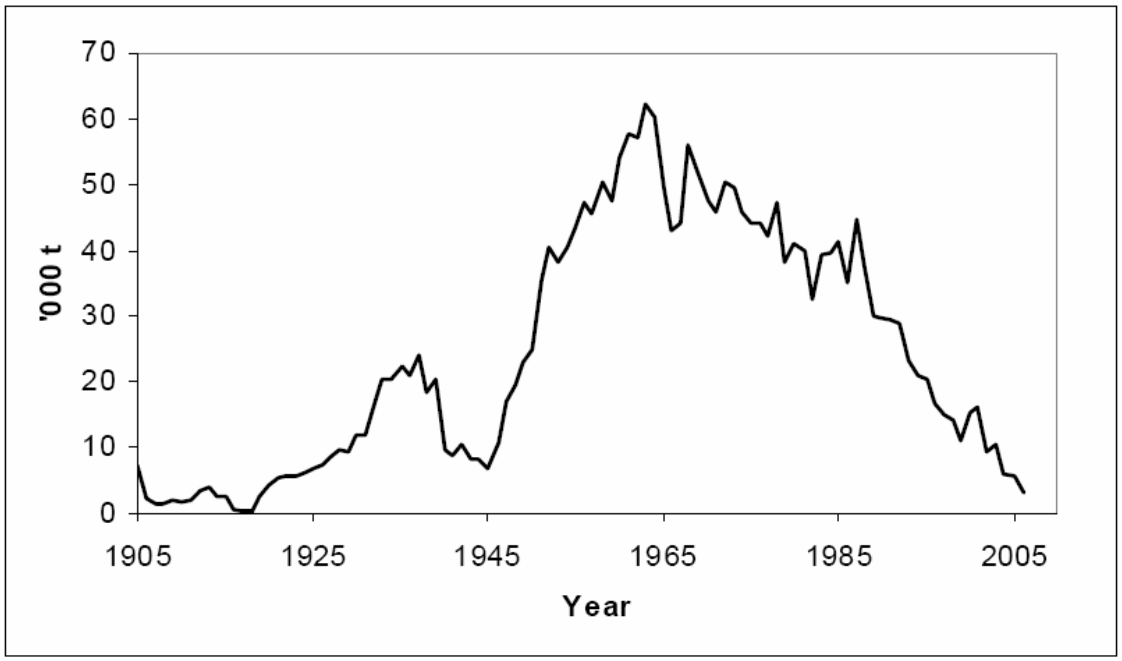

Figure 3. Northeast Atlantic spurdog. WG estimates of total international landings of NE Atlantic spurdog (1905–2006)
Source ICES WGEF 2007