

**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	<i>Trichechus senegalensis</i> 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 18°C 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 distribution 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 tendency 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 downstream 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 disappearance. 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/km², 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 disappearance of the refuge zones for the species in watercourses, lakes and lagoons of West Africa. The reduction of waterflows, 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 stratiotes*, *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 coastal wetlands of the Côte d'Ivoire represent only 1% of the country 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 treatment 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 implemented in 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 Complex, 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, Chad
- (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 sustainable 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 States¹

ANGOLA, BENIN, CAMEROON, CHAD, CONGO, CÔTE D'IVOIRE, DEMOCRATIC REPUBLIC OF CONGO, GAMBIA, GHANA, GUINEA, GUINEA-BISSAU, Equatorial Guinea, LIBERIA, MALI, MAURITANIA, NIGER, NIGERIA, SENEGAL, Sierra Leone, 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 distribution 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 the West 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 disappearance 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 ninth meeting of the Scientific Council in 1999, had noted that the West African manatee was the most threatened 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.

8. References

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¹ CMS Parties in capitals.

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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 Reeves *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 completely 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 research 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 Ndiou 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 excessive 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 Ecu. 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.

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 diminishing. 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 tributaries. 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 February 1995, sets the conditions for the management of wild fauna. The manatee is 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.

