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).

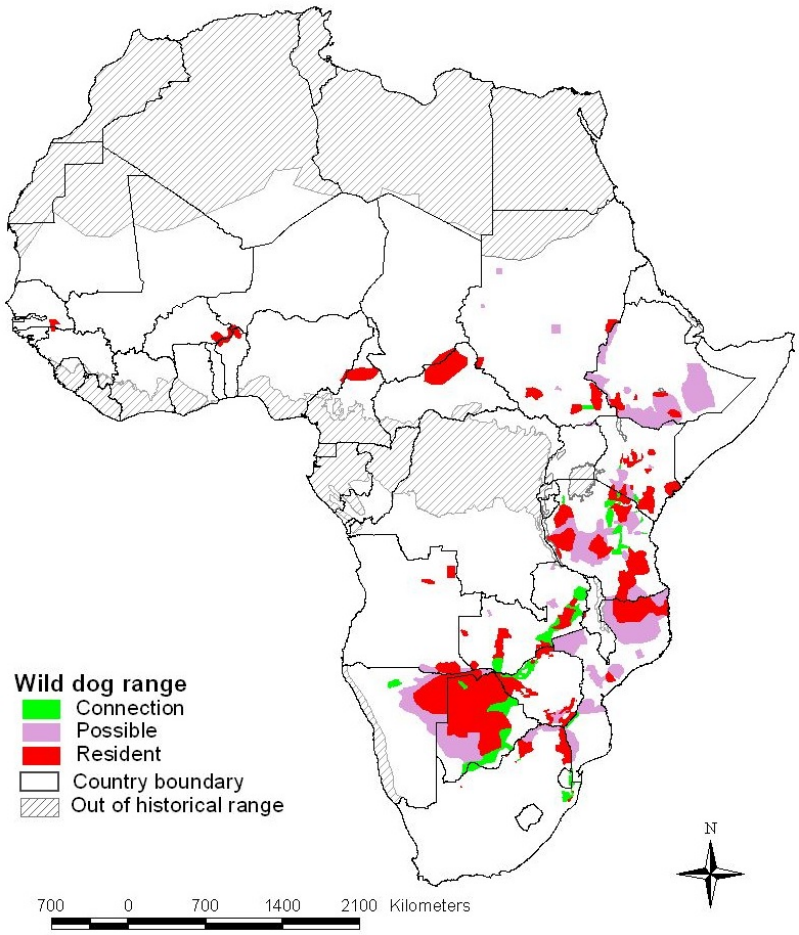

Figure 1 *– Distribution and status of African wild dogs, estimated in 2007. Areas shaded in red are known to support resident populations; areas shaded purple may support resident populations; areas shaded green do not support resident wild dogs but provide landscape connections which are known or suspected 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.

8. References

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[1] CMS Parties in capitals.

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