4. EASTERN AFRICA

4.1. LION RANGE

The Eastern Africa region is definitely one of the main strongholds of the lion with a range for the taxon surpassing 100 millions hectares (Table 18):

- Protected Areas comprise just over one third of the lion distribution area (more than 40 million hectares) with:
 - . 13% for the National Parks;
 - . 12% for the Reserves, and;
 - . 10% for the Hunting Areas.
- Interestingly, it appears that non-gazetted areas form a major part of the lion range with an estimated area of more than 70 million hectares, encompassing a bit less than two third of their overall regional range.



Lion subpopulations in Eastern Africa

Legend

____ International border

GHANA Name of Country

🚄 Main river

2

Lion subpopulation

Lion subpopulation reference number

Lion distribution

Protected Areas (National Parks, Wildlife Reserves, Hunting Areas, etc.)

				Conservatio	ı status & surface (km²)
N ^v Sub-	Country	Area		Protected a	reas	Non-gazetted
роршаноп			Nat. Parks	Reserves	Hunting areas	areas
	Sudan	Zeraf Game Reserve		002'6		
L		Badingilo National Park & surrounds	8,400			8,100
		Nimule National Park	410	00000	c	
	Sub-total /		8,810	9,/00	0	8,100
8	Uganda	Murchison Falls National Park & surrounds	3,839	520	¢	839
	DRC	Virimoa National Park	7 800	070		600
	Ulganda	Oneen Elizabeth National Dark	1 978			
6	Uğanua	Queen Erizaueur Manonar I and Terre Game Reserve & Semiliki Controlled Hunting Area	1,210	540	504	
	Sub-total 9		9,778	549	504	0
	Uganda	Kidepo Valley National Park	1,344			
10	Sudan	Kidepo Game Reserve		1,200		
	Sub-total 10		1,344	1,200	0	0
	Sudan	Boma National Park & surrounds	22,800			7,200
	Ethiopia	Gambella NP & surrounding CHAs:				
		Gambella National Park	5,061			
		Tedo & Jikao Controlled Hunting Areas			5,722	
		Omo & Mago NPs, Tama WR & CHAs:				
		Omo & Mago National Parks	6,230			
		Tama Wildlife Reserve		3,269		
		Omo West Controlled Hunting Area			4,561	
Ŧ		Yabello Sanctuary, Chew Bahir WR, Borana & Murle CHAs:				
-		Yabello Sanctuary	2,496			
		Chew Bahir Wildlife Reserve		4,212		
		Borana & Murle Controlled Hunting Areas			49,538	
		South-Western & Southern Ethiopia non-gazetted areas				60,000
	Kenya	Sibiloi National Park	1,571			
		Mount Kulal Biosphere Reserve		7,000		
		Marsabit National Reserve		2,088		
		Northern Kenya non-gazetted areas				100,000
	Sub-total 11		38,158	16,569	59,821	167,200
	Sudan	Dinder National Park	8,960			
12	Ethiopia	Sudan Border NGAs				30,000
	Sub-total 12		8,960	0	0	30,000

TABLE 18 - STATUS OF LION DISTRIBUTION AREAS IN EASTERN AFRICA

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(continued)

(continued)						
51,000	0	6,689	1,510		Sub-total 19	
50,000				Eastern & North-Eastern Kenya non-gazetted areas		
		2,816		Boni, Dodori & Kiunga National Reserves		
		533		Arawale National Reserve	Kenya	19
1,000				Far Wamo region		
		3,340		Bush Bush Game Controlled Area		
			1,510	Bush Bush Game National Park	Somalia	
0	0	0	525		Sub-total 18	19
			525	Swamp National Park	Somalia	10
15,000	0	0	0		Sub-total 17	1/
15,000				El Bur region	Somalia	ŗ
117,000	0	0	0)	Sub-total 16	
2,000 90.000				nauu 125101 Doaden non-cozetted areas	Ethionia	16
25,000				Nogal Valley region	Somalia	
25,000	23,788	0	6,982		Sub-total 15	
25,000				Non-gazetted areas to the South		
	23,788			Eastern Hararghe Controlled Hunting Area		15
			6,982	Babile Elephant Sanctuary		
				Babile Elephant Sanctuary & Eastern Hararghe HA:	Ethiopia	
15,000	17,454	14,818	5,483		Sub-total 14	
15,000				A far non-gazetted areas		
	9,136			Awash West Controlled Hunting Area		
	8,318			Afdem Gewane & Erer Gewane Controlled Hunting Areas		
		11,205		Gewane & Mille Serdo Wildlife Reserves		4
		1,832		Alledeghi Wildlife Reserve		
		1,781		Awash West Wildlife Reserve		
			4,731	Yangudi Rassa National Park		
			752	Awash National Park		
				Afar Region:	Ethiopia	
15,000	15,163	1,766	2,471		Sub-total 13	
15 000				Non-corrected ensure to the Courth		
	15.163			Bale & Arsi Controlled Hunting Areas		13
		1,766		Bale Wildlife Reserve		
			2,471	Bale Mountains National Park	1	
				Bale Mountain NP, Bale WR, Bale CHAs & surrounds:	Ethiopia	

(continued)	Þ		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~			
132 005	-	12 020	30.660	Masailand non-gazetted areas		
		12,035		Masailand Game Reserves & Conservation Areas		
		8,292		Ngorongoro Conservation Area		
			17,683	Serengeti, Lake Manyara & Tarangire National Parks		
				Masailand:	Tanzania	
6,600				Amboseli dispersal area & group ranches		
			471	Chyulu National Park		
			392	Amboseli National Park		
4,167				Galana Ranch		
13,188				Taita and other ranches		1
		1,833		South Kitui National Reserve		"
			9,065	Tsavo West National Park		
			11,747	Tsavo East National Park		
				Tsavo East & West National Parks & surrounding areas:		
			117	Lake Nakuru National Park		
250				Former Kedong Ranch area		
			68	Hells Gate National Park		
			117	Nairobi National Park		
5,000				Masai Mara dispersal areas		
3,890				Masai Mara group ranches		
		1,670		Masai Mara National Reserve	Kenya	
0	0	1,200	766		Sub-total 21	17
		1,200	766	Aberdare National Park & Faunal Reserve	Kenya	5
6,250	0	3,156	2,658)	Sub-total 20	
		2,621		Bisanadi, Mwingi & Rahole National Reserves		
			1,788	Kora National Park		
			870	Meru National Park		
304				Nananyuk Widlife Conservation Trust/ Sera-Milgis area		
1,350				Ewaso Nyiro (Shaba to Merti dispersal area)		07
		535		Samburu, Shaba & Buffalo Springs National Reserves		00
4,205				Laikipia Ranching & Wildlife Forum		
142				Borana Ranch		
67				Il Ngwesi Group Ranch		
182				Lewa Conservancy		
				Laikipia ranchlands:	Kenya	

(pua)						
64	10	12	13		%	Total
731,534	116,730	139,594	149,347	1,137,205	km²	
96,050	0	32,747	16,403		Sub-total 24	
80,000				Central & Western Tanzania non-gazetted areas		
			1,200	Mahale Mts National Park		
		7,000		Ugalla River Reserve & surrounding PAs		24
		12,747	2,253	Katavi National Park & adjacent PAs		
16,050		13,000	12,950	Ruaha/Rungwa complex		
				Central and Western Tanzania:	Tanzania	
52,000	0	26,850	2,000		Sub-total 23	
2,000				Mosso region		
			500	Ruvubu National Park	Burundi	
			1,500	Akagera National Park	Rwanda	
50,000				North-Western Tanzania non-gazetted areas		23
		1,000		Ibanda/Rumanyika Game Reserve		
		2,850		Biharomolo-Burigi Game Reserves		
		23,000		Moyowosi-Kigosi Game Reserves & adjoining Conserv. Areas		
				North West Tanzania:	Tanzania	

4.2. LION POPULATION SIZE

The lion population size is much better known and documented in the Eastern African region than in the two former regions. While this is true for the Protected Areas, especially the National Parks and a few other Protected Areas such as the Masai Mara National Reserve, non-gazetted areas remain poorly covered in terms of lion surveys. The estimated total population of lions in Eastern Africa probably exceeds 15,000 individuals (Table 19).

-qns on			Lion range	Density of		^o pulation siz	e	Assessment
population	Country	Area	surface (km ²)	lions/100km ²	minimum	estimated	maximum	mode
	Sudan	Zeraf Game Reserve	9,700	0.4	27	68	51	С
r		Badingilo National Park & surrounds	16,500	1.0	116	165	215	C
-		Nimule National Park	410	0.9	3	4	5	С
	Sub-total 7		26,610		149	208	276	
0	Uganda	Murchison Falls National Park & surrounds	5,198	7.0	255	364	473	С
ø	Sub-total 8		5,198		255	364	473	
	DRC	Virunga National Park	7,800	2.0	109	156	203	С
e	Uganda	Queen Elizabeth National Park	1,978	12.0	202	224	246	А
'n		Toro Game Reserve & Semliki Controlled Hunting Area	1,053	0.5	4	5	L	C
	Sub-total 9		10,831		315	385	456	
	Uganda	Kidepo Valley National Park	1,344	1.9	18	25	28	С
10	Sudan	Kidepo Game Reserve	1,200	0.5	4	9	8	C
	Sub-total 10		2,544		22	31	99	
	Sudan	Boma National Park & surrounds	30,000	1.0	160	228	596	С
	Ethiopia	Gambella National Park & surrounding Controlled Hunting Areas	10,783	1.5	113	162	211	C
		Omo & Mago NPs, Tama WR & Omo West CHA	14,060	1.0	66	141	183	C
		Yabello Sanctuary, Chew Bahir WR, Borana & Murle CHAs	56,246	0.5	197	281	365	C
Ŧ		South-Western & Southern Ethiopia NGAs	60,000	0.2	84	120	156	C
-	Kenya	Sibiloi National Park	1,571	1.0	11	16	21	C
		Mount Kulal Biosphere Reserve	7,000	0.2	6	13	17	C
		Marsabit National Reserve	2,088	2.0	29	42	55	C
		Northern Kenya NGAs	100,000	0.2	140	200	260	C
	Sub-total 11		281,748		842	1,202	1,564	
	Sudan	Dinder National Park	8,960					C
12	Ethiopia	Sudan border NGAs	30,000	0.2	42	60	78	C
	Sub-total 12		38,960		42	60	78	
	Ethiopia	Bale Mountains NP, Bale WR, Bale CHAs & surrounds	19,400	0.5	68	26	126	С
13		NGAs to the South	15,000	0.2	21	30	39	C
	Sub-total 13		34,400		40	97	60	
	Ethiopia	Afar PAs (NPs, WRs & CHAs)	37,755	1.0	265	378	491	C
14		Afar NGAs	15,000	0.3	32	45	58	C
	Sub-total 14		52,755			423		
								(continued)

TABLE 19 - LION POPULATION STATUS IN EASTERN AFRICA

66

	Ethiopia	Babile Elephant Sanctuary & Eastern Hararghe CHA	30,	,770	1.0	210	300	390	С
15		NGAs to the South	25,	,000	0.2	35	50	65	С
	Sub-total 15		55,	,770		210	300	390	
	Somalia	Nogal Valley & Haud region	27,	,000	0.3	48	68	88	С
16	Ethiopia	Ogaden NGAs	06	,000	0.2	35	180	65	С
1	Sub-total 16		117,	,000		83	248	153	
ţ	Somalia	El Bur region	15,	,000	0.9	60	128	166	С
17	Sub-total 17		15,	,000		90	128	166	
10	Somalia	Swamp National Park		525	4.0	15	21	27	С
10	Sub-total 18			525			21		
	Somalia	Bush Bush Game NP, Bush Bush CHA & Far Wamo region	5	,850	3.4	139	199	259	С
10	Kenya	Boni & Dodori National Reserves	6	,216	3.3	52	74	96	С
-		Arawale & Kiunga NRs; Eastern & North-Eastern NGAs	51,	,133	0.2	70	102	130	С
1	Sub-total 19		59.	,199		191	273	355	
	Kenya	Laikipia ranchlands	4	,596	5.7	211	264	317	В
00		Samburu, Shaba & Buffalo Springs National Reserves & surrounds	5	,189	4.5	69	98	127	В
07		Meru & Kora National Parks & adjoining NRs	ζ,	,279	1.2	52	65	78	В
	Sub-total 20		12,	,064		332	427	522	
5	Kenya	Aberdare National Park & Faunal Reserve	1,	,966	8.2	113	162	211	С
21	Sub-total 21		1,	,966		130	162	194	
	Kenya	Masai Mara National Reserve & surrounding areas	1.	,670	32.8	492	547	602	Α
		Masai Mara group ranches	τ, Γ	,890	8.2	282	319	422	В
		Masai Mara dispersal areas	5.	,000	1.5	35	75	65	С
		Nairobi National Park		117	18.8	20	22	24	A
		Hells Gate National Park & Former Kedong Ranch area		318	2.8	7	6	11	В
		Lake Nakuru National Park		117	31.2	33	37	41	A
77		Tsavo East & West National Parks & surrounding areas	40,	,000	1.9	600	750	006	В
		Amboseli & Chyulu National Parks & surrounding areas	۲. ۲	,463	1.7	117	130	143	A
	Tanzania	Serengeti, Manyara, Tarangire National Parks & Ngorongoro CA	25,	,975	15.0	3,117	3,896	4,675	В
		Masailand Game Reserves & Game Conservation Areas	12,	,035	2.0	127	241	235	С
		Masailand NGAs	100	,000	0.3	168	300	312	С
	Sub-total 22		4,437 196,	,585		4,998	6,316	7,430	
									(continued)

(puə)			<u> </u>		<u>`</u>			
	18,811	15,744	11,268		1,137,205	Total	9 countries	18 sub-pop.
	5,743	4,418	3,093		145,200	4,418	Sub-total 24	
C	208	160	112	0.2	80,000	ntral & Western Tanzania NGAs	C	
С	23	18	13	1.5	1,200	ahale Mts National Park	2	- 1
С	364	280	196	4.0	7,000	alla River Reserve & surrounding PAs	D	70
С	780	600	420	4.0	15,000	tavi National Park & adjacent PAs	K	
С	4,368	3,360	2,352	8.0	42,000	aha/Rungwa complex	Tanzania R	
	887	682	477		80,850	637	Sub-total 23	
С					2,000	osso region	2	
С					500	vubu National Park	Burundi R	
С	59	45	32	3.0	1,500	agera National Park	Rwanda A	64
C	130	100	70	0.2	50,000	urth-Western Tanzania NGAs	Z	23
С	26	20	14	2.0	1,000	nda/Rumanyika Game Reserves	It	
С	74	57	40	2.0	2,850	haramolo-Burigi Game Reserves	B	
С	598	460	322	2.0	23,000	yyowosi-Kigosi Game Reserves & adjoining GCAs	Tanzania	

SUB-POPULATION N° 7

• Sudan

The area situated on the right (Eastern) bank of the Nile is considered as belonging to the Eastern Africa region.

Once again, the overall figures of the lion population in this country have to be taken as highly speculative. Among the eight individuals contacted for this survey, due to poor communications, accessibility, etc. only one was able to provide estimates.

The continuing civil war in the South has adversely affected wildlife in general, including lions. Most parks have been overrun by pastoralists and/or farmers (M. Sommerlatte, pers. comm.; A. Radcliffe, pers. comm.).

In South Sudan, the lion is distributed in nearly all National Parks, Game Reserves and some of the Hunting Blocks, and it is found in all types of habitats such as open and wooded grasslands, forest and rocky hills (Kenyi, 1985).

In the Upper Nile region, the lion is present in the Provinces of Sobat, Unity as well as Jonglei (Dennis Akwoch Obat, 1985).

SUB-POPULATION N° 8

• Uganda

Murchison Falls National Park (formerly Kabalega Falls National Park) is supposed to hold between 200 and 300 lions at present (A. Radcliffe, pers. comm.; R. Lamprey, pers. comm.). Movements of lions from this park to the neighbouring DRC (Ituri Province, Monts Bleus) are unlikely given the geographical constraints (a lake and a river).

Overall, the total estimate of 500-600 lions for Uganda seems reasonable (A. Radcliffe, pers. comm., R. Lamprey, pers. comm.).

SUB-POPULATION N° 9

• Democratic Republic of Congo

Even though the DRC, as a country, belongs to the Central African Region, Eastern lion populations of the DRC have been incorporated into the Eastern Africa region because they are historically connected with lion populations of Eastern Africa and not with those of Central Africa. Recent political turmoil in the region must put the continued well-being and the future of these lions in question.

In the Virunga National Park, consisting of 7,800 km², the La Rwindi plains section of the Park is a most suitable habitat for lions (Ph. Chardonnet, pers. comm., 2002). The Park is

thought to have between 100 and 200 lions (156; E. Bashige, pers. comm., 2002) which are however facing an uncertain future mostly as a result of political instability in the region.

• Uganda

The lions of Queen Elizabeth National Park (formerly, Ruwenzori National Park) have been extensively studied in the past (*inter alia*: Din, 1978; Van Orsdol, 1981, 1982) and currently as part of the LPP predator & scavenger project.

In 1998 the population of lions in Queen Elizabeth National Park ranged between 160 and 210 individuals for an overall density of 12 lions/100 km² (Dricucu, 1999). Today, according to a survey conducted more recently, there may be as many as 300 lions (Lamprey, 2000; R. Lamprey, pers. comm.; A. Radcliffe, pers. comm.). The population has been increasing over several years following better protection and greater prey availability. The reproductive potential of the lionesses has been studied and has been found good (Dricuru, 2000). In this Park, the pride size varies between 2 and 23 with an average of 9.5 (Dricucu, 1999).

The health status of lions in Queen Elizabeth National Park has been studied. Serological surveys have been conducted and found evidence of antibodies (Dricuru, 2000) given below:

- In lions (n=9): significant seroprevalence in lions for FIV, FcaV and FeHV; low seroprevalence for CDV and FPV, and;
- In domestic cats: high seroprevalence for FcaV, FeHV and FIP, no seroprevalence for CDV and FPV

It must be re-emphasised that the presence of antibodies does not mean that animals are sick. "*We don't have evidence so far that lions are disappearing in alarming numbers due to cat-AIDS*" (Siefert, 2000).

Vaccination of domestic dogs and cats in the vicinity of Queen Elizabeth NP was carried out to help prevent the spread of CDV and rabies in wild carnivores. Bovine tuberculosis is also known to occur, at least in buffalo, for many years in Queen Elizabeth NP (M. Woodford, pers. comm.), even though it has not yet been observed in lion there (Siefert, 2000).

Conflicts with neighbouring communities and their livestock are common, and a number of lions have been poisoned. Other threats to lions are armed conflicts on the DRC border (R. Lamprey & A. Radcliffe, pers. comm.)

Toro Game Reserve and Semliki Controlled Hunting Area have a gradually increasing lion population over recent years, possibly due to an influx from the Congo where they had been poisoned some years previously. This is largely due to increased protection (R. Lamprey & A. Radcliffe, pers. comm.).

SUB-POPULATION N° 10

• Sudan

The continuing civil war in the South has adversely affected wildlife in general, including lions. Most parks have been over run by pastoralists and/or farmers. (M. Sommerlatte, pers. comm.; A. Radcliffe, pers. comm.).

• Uganda

Among threats to lions in Uganda are armed conflicts on the Sudanese border, and infected livestock from South Sudan moving into Kidepo Valley National Park and apparently poisoning incidents as a result of stock raiding. The sub-population appears to be increasing at least in Kidepo Valley NP (R. Lamprey, pers. comm.; A. Radcliffe, pers. comm.).

SUB-POPULATION N° 11

• Sudan

Preliminary surveys are underway in Boma National Park, and others are planned (M. Sommerlatte, pers. comm.). However, this survey has no information on lions there.

• Ethiopia

It is worth mentioning that information on Ethiopia is hard to obtain and accurate information even harder. The present study has shown large discrepancies between the figures provided by sources, with up five-fold variance in estimates for the country as a whole. For instance two sources produced very different estimates of (i) 900 to 1050 lions, certainly unlikely to exceed 1,500 (A. Racliffe, pers. comm., 2002) and (ii) a "speculated" population of "roughly" 4,900 lions in total (Y.D. Abebe & T. Mattanovich, pers. comm., 2002). Both figures are useful considering the paucity of information and the respondents must be respected for bravely making a considered guess in the absence of any other data. In the case of sub-population n° 11 it exists in a very large area encompassing a number of National Parks, Controlled Hunting Areas (73,889 km²), and non-gazetted areas (67,200 km²) creating a total area of 141,000 km² which is estimated to hold a population of over 700 lions. These figures however, both the area and population estimates, must be treated with the utmost caution.

• Kenya

In the Northern Kenya, lions are present, but scattered in low densities. However, very little is known about the lions in this region. A figure of 180 lions has been tentatively suggested for an area of 185,000 km² (Radcliffe, pers. comm.) but should be treated with caution.

SUB-POPULATION N° 12

• Sudan

The lion is reported in Dinder National Park (Ernst & Elwasila, 1985) and in the adjacent Rahad Game Reserve (Mahgoub A., El Badawi & Salah A. Hakim, 1985). The IUCN Directory of Afrotropical Protected Areas (IUCN, 1987) mentions lions in Dinder NP. However, no recent information has been received on the lion numbers in this area.

In the late 1970's and early 1980's, a great deal of wildlife research effort in Sudan had been concentrated in Dinder National Park as it was considered as the most important wildlife area in Northern Sudan, even though the Park had to face tremendous pressures from entrance of livestock for grazing, mechanized cultivation in the wet season, felling of trees and poaching (El Gaily O. Ahmed *et al.*, 1985). However, the current situation is not clear.

• Ethiopia

There is no written record of lion on the Ethiopian side of the border, opposite to Dinder NP to the available knowledge. However, T. Mattanovich (pers. comm.) considers that lions are frequent nearly all along the Sudan-Ethiopian sides.

SUB-POPULATION N° 13

• Ethiopia

Little is known about this sub-population of lions. Much of their range falls within the protected area system, Bale Mountains National Park, Bale Wildlife Reserve and Bale and Arsi Controlled Hunting areas totalling approximately 19,400 km² and non-gazetted areas to the South totalling approximately 15,000 km². An estimated population size of 97 and 30 individuals is given for the two areas respectively, but again it should be treated with caution. The population is "disjointed" and may merge with the Wabi Shabelle sub-population (sub-population n° 15). Poaching and the presence of livestock are threats to their existence. While the habitat remains stable the lion populations may be stable or declining (S. Williams, pers. comm.).

SUB-POPULATION N° 14

• Ethiopia

In Ethiopia, there appear to be several places where lions are regularly seen. The Afar region in the North-eastern part of the country is one of them (Y.D. Abebe & T. Mattanovich, pers. comm.).

"[In Tellalak-Dawe and Fursi-Artuma proposed Hunting Blocks, Afar National Regional State] the local people believe that the numbers of lion and hyena have increased and they have requested the Regional Agriculture Bureau to seek solutions for these problem-creating



Tanzanian lions, Selous Game Reserve (Photo : O. Buttin).



South African lion, Kruger National Park (Photo : B. Chardonnet).



South African lion, Kruger National Park (Photo : B. Chardonnet).



South African lion, Madikwe Wildlife Reserve (Photo : B. Chardonnet).



South African lioness, Kruger National Park (Photo : O. Buttin).

animals. Leopard, lion and hyena were found to be problem animals for the local people. Recently these predators have attacked their livestock" (Cherie Enawgaw et al., 2001).

SUB-POPULATION N° 15

• Ethiopia

Babile Elephant Sanctuary and Eastern Haraghe Controlled Hunting Area encompass over 55,000 km² of suitable lion habitat comprising 6,982 km² of National Park and 23,788 km² of Hunting Area. The population is stable or declining and subject to the familiar twin threats of poaching and livestock encroachment (S. Williams, pers. comm.).

Interestingly, this peculiar sub-population in the Harar Region contains a number of particularly small lion with very dark manes, reminiscent of the now extinct races of Barbary lions and Cape lions (T. Mattanovitch, pers. comm.).

SUB-POPULATION N° 16

• Ethiopia

Within the Somali Region of Ethiopia, the Ogaden desert tentatively comprises about 90,000 km² of non-gazetted habitat suitable for low densities of lion. Little is known about this population and it is tentatively estimated at 180 individuals, but this must be treated with caution.

• Somalia

The few experts with field knowledge in Somalia are quite consistent about the distribution of lions in Somalia.

The sub-population n° 16 is spread on both sides of the North-eastern border between Somalia and Ethiopia. Laurent (2002) considers that this sub-population expands as far East as the coastline along the Tug Darror valley.

Between 1984 and 1987, Chazée (1987) observed lions along the Djouba River, and especially in Sablale, Baidabo, Bardera, Gelib, Kisimoyo and Chiamboni.

SUB-POPULATION N° 17

• Somalia

The El Bur region of Somalia comprises approximately 15,000 km² of suitable lion habitat with estimated densities of 0.7 to 1.0 animal per 100 km². There is little information on their quarry species. Civil unrest and poor Government structures are seen as threats to this sub-population (A. Radcliffe, pers. comm.).

SUB-POPULATION N° 18

• Somalia

The Swamp National Park lion sub-population appears to occur at high densities. The national park itself is small (525 km²) with a wildlife population density of 4 animals per 100 km² giving a total population of about 20 lions. However, civil unrest and a lack of Government structure are cited as threats and, for a population contained in such a small area, it is hardly surprising that it is considered to be declining.

SUB-POPULATION N° 19

• Somalia

In the South of Somalia, lions are not considered rare. "The lower Juba and the territories beyond this river, as far as the Kenya border, are still more favourable to the presence of this feline, even if with ample interruption due to human settlement" (F. Fagotto, 1985).

• Kenya

Boni and Dodori National Reserves are hosting lions at a conservative estimate of 3.3 individuals per 100 km² in 2002, giving a total of 45 lions in Boni N.R. and 29 lions for Dodori N.R. (A. Pelizzoli, pers. comm.).

SUB-POPULATION N° 20

• Kenya

Several references provide information on the lion population in Laikipia District:

- According to a recent survey (Franck, 2001) on lion depredation, the Laikipia District has about 175 lions or about 0.06 lions/100 km², and;
- According to another source (Martin, 2001), "*perhaps 150 lions inhabit the 4,000 square-mile plateau*", which would mean a density of about 0.02 lions/100 km².

SUB-POPULATION N° 21

• Kenya

Aberdare National Park represents a special case as far as lions are concerned, due to the reintroduction of the species into the park, which is fenced, in the 1950's.

By 1996 there were estimated to be 149 (probably an overestimate). These were perceived to be having an adverse effect on the giant forest hog populations and that of the rare East African bongo. Consequently, culling was introduced. Approximately 70 were killed in total,

and by 1999/2000 culling stopped, as there were hardly any signs of lion (A. Radcliffe, pers. comm.).

Considerable discrepancies exist between sources of information regarding this Park. Some informants mention a lion population size of more than 150, while others quote less than 20 (Rotich, 2000; A. Radcliffe, pers. comm.).

SUB-POPULATION N° 22

• Kenya

In Nairobi National Park during the period 1960's to 1997, lions averaged around 30 and in 1997, prior to the El Niño rains, there were 4 prides and a total of 39 lions. During the rains the ungulate prey, with the lions following them, disperse to the South. Six lions were poisoned along Kitengela, and 22 were chased down with dogs and speared in nearby local communities. By 1999, there were 11 lions in the park. Following the rains in early 2000, 9 lions were poisoned along Kitengela. Those who returned following those rains have now managed to breed up, and total 22 in 2 prides. Many of the migratory ungulate prey have not however returned, having been poached. Ancient studies have shown that the Athi-Kapiti plains act as dispersal areas for the sub-adults from Nairobi NP who leave their prides (Rudnai, 1983; J. Cavenagh, pers. comm.; A. Radcliffe, pers. comm.).

The Masai Mara ecosystem contains the biggest share of the lion population of Kenya (Oguto & Dublin, 1998). The lion population of the Masai-Mara ecosystem certainly does not stay within the Reserve itself and ranges outside the boundaries, as do other large mammals which make up their prey species: "*an aerial count by the WWF done in May 1993, for example, showed that 26% of the elephants were in dispersall areas, and 21% of the buffaloes stayed outside the Reserve*" (Mbugua, 1994 *in* Singida, 1995).

In Amboseli National Park systematic poisoning by local communities reportedly in response to a perceived failure to react to stock killing lions, combined with habitat changes (reduction in swamp areas), and in prey availability, reduced the population to 2 lions by 1990. Between 1991-1993, there were no lion in the Park. In 1994, 2 lions entered from the Chyulus and neighbouring areas, followed by others. These have bred, and there are presently 40 lions in the park (D. Western, pers. comm.; C. Moss, pers. comm.; A Radcliffe, pers. comm.).

In Nakuru National Park in 1987, there was 1 male lion in the Park. In 1989 a female was brought from Nairobi, and more were added later. These have bred up, prey densities are high, and presently there are 33-40 lions in the Park (J. Dawson, pers. comm.; A. Radcliffe, pers. comm.).

The Hells Gate National Park and former Kedong Ranch area have a small population of approximately 9 lions within 318 km² (J. Dawson, pers. comm.).

Tsavo East and West National Parks and surrounding areas constitute approximately 40,000 km² of suitable lion habitat with an estimated density of 2.8 per 100 km² giving an overall population of 750 animals with a minimum of 600 and maximum of 900 within the given confidence limits (D. King, pers. comm.; M. Smeth-Smith, pers. comm.).

• Tanzania

In Masailand (Serengeti National Park, Lake Manyara and Tarangire National Parks, Masailand Game Reserves and Conservation Areas, Masai NGAs) populations are stable in Protected Areas, but there may be some range degradation caused notably by off road driving by tour operators. Changes in animal behaviour are noticeable due to habituation and disturbance due to high levels of game viewing tourism. Outside Protected Areas, numbers are decreasing due to competition with livestock (PAC, poisoning). However, some local communities are affording protection to lions as a result of income generation through community-based conservation programmes (L. Seige, R Baldus & V. Booth, pers. comm.).

SUB-POPULATION N° 23

• Uganda

No more Ugandan lions occur from this sub-population in Uganda. The lion has disappeared from Southern Uganda, even from Protected Areas such as Lake Mburo National Park due to the heavy competition with livestock, to farming encroachment by a growing human population and to illegal hunting (Averbeck, 2001). Lions have twice re-entered this Park coming from Tanzania, and twice been poisoned by local communities. Last time in 1999, 3 individuals were poisoned (A. Radcliffe, pers. comm.).

• Rwanda

Lions were abundant in Akagera National Park and Mutara Hunting Zone before the 1994 political events. During and after the conflict, many lions were chased away or killed by soldiers who established permanent camps in the Park and by livestock herders bringing large numbers of cattle from Uganda and settling down in these Protected Areas (Ph. Chardonnet, pers. comm.). Draulans (1997 *in* Draulans & Van Krunkelsven, 2002) observed large numbers of lions roaming Rwanda's Akagera National Park in 1995, a year after the civil war. Lions are still present in the Southern part of the Park where tsetse flies tend to keep the cattle away.

• Burundi

According to Ph. Chardonnet (pers. comm.) who worked 3 years with Burundian cattleherders, the lions are no longer permanently resident in Burundi. However, occasionally lions may enter from Tanzania into:

- (i) The Ruvubu National Park, East of Burundi, where they follow the Ruvubu river, and;
- (ii) The Mosso region, South-east of Burundi, where they cross the narrow Malagarazi river into the marshes on the Burundi side.

• Tanzania

In North West Tanzania (Moyowasi-Kigosi Game Reserves and adjoining Conservation Areas, Biharomolo-Burigi & Ibanda/Rumanyika Game Reserves), the refugee crisis from 1994 onwards had a serious impact on the Miombo woodlands of the area. It can be expected to have impacted on wildlife numbers and hence on the lion populations. There are areas

where a lot of poisoning has been observed and/or there is high human pressure (e.g. in the South of Moyowosi GR, Ibanda GR). No lions known are to exist in Rumanyika GR. Burigi GR has a lion population considered to be "healthy" but there are no figures given. Kimisi is showing increasing reports of lion according to observations over 2 years. These populations are anticipated to remain stable in Protected Areas (L. Seige, R Baldus & V. Booth, pers. comm.; & Caro, 1999).

SUB-POPULATION N° 24

• Tanzania

In Central and Western Tanzania (Ruaha/Rungwa system, Katavi National Park/Rukwa, Ugalla, Mahale, NGAs), lion populations are stable in Protected Areas. Numbers are probably declining outside Protected Areas due to competition with livestock. Lions are locally destroyed through PAC and local poisoning.

These populations are anticipated to remain stable in Protected Areas (L. Seige, R Baldus & V. Booth, pers. comm.; Caro, 1999).

-dus °N pop.	Country	Area	Lion population	Lion habitat quality	Main pre	y for lions	Conservation efficiency	Lion conservation constraints
1			trend	trend	Wildlife	Livestock	(rating 0 to 3)	
	Sudan	Zeraf Game Reserve			Х	Х		livestock, poaching, civil unrest
7		Badingilo National Park & surrounds			Х	х		livestock, poaching, civil unrest
		Nimule National Park			Х	Х		livestock, poaching, civil unrest
8	Uganda	Murchison Falls National Park & surrounds		S	Х		2	poisoning, livestock
	DRC	Virunga National Park		D	Х			civil unrest
6	Uganda	Queen Elizabeth National Park	S	S	х		3	poisoning, disease
		Toro Game Reserve & Semliki CHA	S	S	Х		2	poisoning, disease
10	Uganda	Kidepo Valley National Park		S	Х	Х		poisoning, livestock
11	Sudan	Kidepo Game Reserve			Х	Х		livestock, poaching, civil unrest
	Sudan	Boma National Park & surrounds		S	Х	Х		livestock, poaching, civil unrest
	Ethiopia	Gambella NP and surrounding Hunting Areas	S	s	Х	Х	1	livestock
		Omo & Mago NPs, Tama WR & Omo West CHAs	S	s	х	х	1	livestock
1		Yabello S, Chew Bahir WRs, Borana & Murle HAs			х	х		livestock
-	Kenya	Sibiloi NP		S	х		2	
		Mount Kulal Biosphere Reserve			Х			
		Marsabit National Reserve		S	Х	Х	2	
		North-western Kenya non-gazetted areas		S	х			livestock
, ,	Sudan	Dinder National Park			Х			
71	Ethiopia	Sudan Border			Х			
13	Ethiopia	Bale Mountain NP, Bale WR & HAs	S	S	Х	Х	2	livestock
14	Ethiopia	A far Region	S	S	Х	Х	2	livestock
15	Ethiopia	Babile Elephant S & Eastern Haraghe HA	S	S	Х	Х	1	livestock
	Somalia	Nogal Valley			Х	Х		livestock, poaching, civil unrest
16		Haud			Х	х		livestock, poaching, civil unrest
		Ogaden			Х	Х		livestock, poaching, civil unrest
17	Somalia	El Bur region			Х	Х		livestock, poaching, civil unrest
18	Somalia	Swamp National Park			Х	Х		livestock, poaching, civil unrest

TABLE 20 - TRENDS AND CONSTRAINTS IN LION CONSERVATION IN EASTERN AFRICA

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(continued)

	Somalia	Bush Bush Game National Park			х	Х		livestock, poaching, civil unrest
		Bush Bush Game Controlled Area			Х	Х		livestock, poaching, civil unrest
0		Far Wamo			Х	х		livestock, poaching, civil unrest
61	Kenya	Arawale National Reserve			Х			
		Boni, Dodori & Kiunga National Reserves			Х			
		North-eastern Kenya non-gazetted areas		S	Х	Х		livestock
	Kenya	Laikipia ranchlands	S	S	Х	Х	3	
		Samburu, Shaba & Buffalo Springs NRs	S	S	Х		3	
		Ewaso Nyiro (Shaba to Merti dispersal area)	S	S	Х			
20		Nananyuk Widlife Conserv. Trust/ Sera-Milgis	S	S	Х		2	
		Meru National Park	S	S	Х		3	
		Kora National Park	S	S	х		2	
		Bisanadi, Mwingi & Rahole NRs	S	S	Х		2	
21	Kenya	Aberdare National Park & Faunal Reserve		S	Х		3	culling
	Kenya	Masai Mara National Reserve	S	s	х	Х	3	spearing
		Mara group ranches			Х	Х	2	spearing, poisoning
		Masai Mara dispersal areas		D	x	х	1	spearing, poisoning, habitat reduction
		Nairobi National Park	S	S	x		Э	
		Hells Gate National Park			Х			
"		Former Kedong Ranch Area			Х			
77		Lake Nakuru National Park		S	Х		Э	
		Tsavo East & West NPs & surrounding areas	S	S	х	х	2	poaching of prey, poisoning
		Amboseli National Park	S	S	Х	Х	3	poisoning, spearing
		Chyulu National Park			Х			poisoning, spearing
		Amboseli dispersal area & group ranches			Х	Х		poisoning, spearing
	Tanzania	Maasailand	S	S	Х	Х		poisoning, spearing
	Tanzania	North West Tanzania	S	S	Х	Х	2	poisoning, livestock
33	Rwanda	Akagera National Park	D	D	Х	Х	1	livestock, poaching, civil unrest
Ç	Burundi	Ruvubu National Park		S	Х	Х		settlement
		Mosso region			Х	Х		livestock
24	Tanzania	Central and Western Tanzania	S	S	Х	Х	2	livestock
								(end)

Rate 0 to 3: 0=low; 3=high No information = missing or insufficient data I = increasing S = stable D = decreasing

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5. SOUTHERN AFRICA

5.1. LION RANGE

Lion range in the Southern Africa Region surpasses 100 millions hectares, an area very similar to the Eastern African lion range (Table 21):

- Protected Areas cover 70% of the region's lion distribution area (about 70 million hectares) with:
 - . 28% in National Parks;
 - . 39% in the Reserves, and;
 - . 3% in Hunting Areas.
- Interestingly, it would appear that non-gazetted areas, which include conservancies, cover an estimated area of just over 30 million hectares, a very different situation from the three other regions.

DEMOCRATIC REPUBLIC TANZANIA **OF CONGO** 25 26 32 ANGOLĂ E \$ Ŷ 1 B 33 30 MBAB 35 IBI M BC 34 3 SWAZILAND LESOTHO REPUBLIC **OF** 36 SOUTH AFRICA

Lion subpopulations in Southern Africa





OI P			C	onservation	status & surface (1	km²)
N [~] Sub-	Country	Area		Protected an	reas	Non gazetted
роршаноп			Nat. Parks	Reserves	Hunting areas	areas
	Tanzania	Mikumi National Park, Selous Game Reserve & Kilombero GCA	3 230	51 770		
		Southern Tanzania non-gazetted areas				45 000
36	Malawi	Liwonde National Park & surrounds	548			252
6	Mozambique	Nyassa Game Reserve		15 000		
		Northern Mozambique non-gazetted areas				50 000
	Sub-total 25		3 778	66 770	0	95 252
	DRC	Upemba & Kundelungu National Parks	19 330			
26	Zambia	Sumbu complex (National Parks & surrounding GMAs)	6 034	540		
	Sub-total 26		25 364	540	0	0
	Zambia	North & South Luangwa complex	16 660	24 154		
		Chisomo, Luano & West Petauke Game Management Areas		16460		
		Lower Zambesi National Park & Kariba Shore	4 140			5 000
		Nyika National Park (Zambia side)	80			
	Malawi	Nyika National Park (Malawi side) & Vwaza Marsh Wildlife Reserve	3 134	1 000		
27		Nkhotakota Wildlife Reserve		1 500		
		Kasungu National Park	2 000			
	Zimbabwe	Mana Pools National Park, surrounding Safari Areas & Communal Lands	2 196		10 624	180
		Matusadona & Chizarira National Parks, surrounding SAs & CLs	3 280	269	2 794	7 657
	Mozambique	Tete Province and neighbouring regions				25 000
	Sub-total 27		31 490	43 383	13 418	37 837
	Zambia	Kafue, Lochinvar & Blue Lagoon National Parks & surrounding GMAs	23 260	45 149		
38		West Lunga National Park & surrounding Game Management Areas	1 684	10 070		
07	Angola	Kameia National Park & Moxico non-gazetted areas	14 450			10 000
	Sub-total 28		39 394	55 219	0	$10 \ 000$
						(continued)

TABLE 21 - STATUS OF LION DISTRIBUTION AREAS IN SOUTHERN AFRICA

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gela Marriaga & Luian Parial Reserves & Canado-Cabaugo NGAs 13,30 38,070 14,741 stratus Konducry Borswar Stratus Borswar 8,956 38,070 14,741 stratus Charado-Cabaugo NGAs 8,956 38,070 14,741 19,657 mbhave Nordierr Borswar Stratus 7,980 38,056 35,000 19,657 mbhave Nordierr Chobe rive (Chobe N& strroutilite Management Arceis) 7,980 38,056 35,000 19,657 mbhave Nordi-File Order rive (Chobe N& strroutilite Management Arceis) 7,980 38,056 35,000 19,657 mbhave Nordi-Filest - Manadorland: Hoange National Park 8,794 14,657 3,500 4,000 combigue Zambesh Portic: Element Reserve & Nordi A 3,500 5,300 6,126 combigue Zambesh Portic: Element Park 8,774 14,657 3,500 6,126 combigue Zambesh Portic: Element Park 3,759 100 10,000 6,120 control Zambesh Portic: Control Chot Forter (Chot NR, SAA & FL) & Grayi complex 3,759 14,60 3,600 control Zambesh Portic: Zambesh Portic: 2,7156 14,60 2,000	(continued)	400	_	1,200		Sub-total 35
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tgolaMavinga & Luiana Partial Reserves & Cuando-Cubango NGAs14,35015,000mbiaLiuwa Plain & Sioma-Ngwezi National Parks & Vest Zambezi GMA8,93638,07015,000nswanaNorthern Boswana:Northern Boswana:14,74114,741Nawando'Chobe riverfront (Chobe NP & Wildlife Manag. Areas)2,0003,48719,637Dry North (Chobe NP & Wildlife Manag. Areas)7,98038,09619,637Dry North (Chobe NP & Wildlife Management Areas)7,98038,0965,370Dry North-WeatMatexic Connor and Chobe river (Chobe NP & Wildlife Management Areas)14,6515,3009,637Dry North-WeatManagement Areas)14,6515,3009,637MabuweNorth-WeatMatexi complex (Inc. NPs, SAs & FL) & Gwayi complex8776003,5005,372Sub-total 29Zambesia Province: Gorongosa National Park, Marrome Reserve,3,75010,0006,120Zambesia Province: Gorongosa National Park, Marrome Reserve,3,75010,0006,120Sub-total 30Zambesia Province inc. Zinhave & Banhire National Parks3,75010010,0006,120Sub-total 30Gaza & Ihambane Province inc. Zinhave & Conservancies5,0533,82015,400Matersi Connola Park, surrounding Game Reserves <td>28,000</td> <td>154</td> <td>6,335</td> <td>36,538</td> <td></td> <td>Sub-total 31</td>	28,000	154	6,335	36,538		Sub-total 31
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ImageMavinga & Luiana Partial Reserves & Cuando-Cubango NGAs14,35015,000Iniva Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,93638,07015,000Itiwwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,93638,07015,000Itiwwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,93638,07015,000Itiwwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,93638,07015,000Itiwwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,9363,48714,741Itiwa Plain & North (Chobe NP & Wildlife Management Areas)2,0003,4877,98038,096ItimiaKaudom Game Reserve & Nyae Nyae7,98038,09631,83319,637ItimiaCaprivi5,30019,63719,637ItimiaNorth-West - Matabeleland:5,30019,637				14,651	Hwange National Park	
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IgolaMavinga & Luiana Partial Reserves & Cuando-Cubango NGAs14,35015,000InbiaLiuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,93638,07015,000AtswanaNorthern Botswana:8,93638,07014,741AtswanaNorthern Botswana:14,74114,74114,741Kwando/Chobe riverfront (Chobe NP & Wildlife Manag. Areas)2,0003,4877,98038,096Dry North (Chobe NP & surrounding Wildlife Management Areas)7,98038,0963,487amibiaKaudom Game Reserve & Nyae Nyae31,83331,83331,833	19,637		5,300		Caprivi	
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ngola Mavinga & Luiana Partial Reserves & Cuando-Cubango NGAs 14,350 15,000 imbia Liuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA 8,936 38,070 otswana Northern Botswana: 8,936 38,070 otswana Northern Botswana: 14,741 otswando/Chobe riverfront (Chobe NP & Wildlife Manag. Areas) 2,000 3,487			38,096	7,980	Dry North (Chobe NP & surrounding Wildlife Management Areas)	
ngola Mavinga & Luiana Partial Reserves & Cuando-Cubango NGAs 14,350 15,000 mbia Liuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA 8,936 38,070 otswana Northern Botswana: 8,936 38,070 otswana Okavango Delta (Moremi Game Reserve & Wildlife Manag. Areas) 14,741			3,487	2,000	Kwando/Chobe riverfront (Chobe NP & Wildlife Manag. Areas)	
rgola Mavinga & Luiana Partial Reserves & Cuando-Cubango NGAs 14,350 15,000 Imbia Liuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA 8,936 38,070 Dtswana Northern Botswana:			14,741		Okavango Delta (Moremi Game Reserve & Wildlife Manag. Areas)	
ngolaMavinga & Luiana Partial Reserves & Cuando-Cubango NGAs14,35015,000umbiaLiuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA8,93638,070					Northern Botswana:	Botswana
ngola Mavinga & Luiana Partial Reserves & Cuando-Cubango NGAs 14,350 14,350			38,070	8,936	Liuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA	Cambia
	15,000			14,350	Mavinga & Luiana Partial Reserves & Cuando-Cubango NGAs	vngola

Fenced areas							
	South Africa						
36	Swaziland						
	Sub-total 36						
÷	km ²	1,039,2	289	9,139	405,404	27,472	317,197
1 OTAL "	%		28		39	3	31
							(pua)

* excluding fenced areas

5.2. LION POPULATION SIZE

This is probably the best-known lion population of all the regions. However, most of this understanding is still centred upon populations living in Protected Areas, especially National Parks and a few Wildlife Reserves. Those lions living in non-gazetted areas still remain, on the whole, poorly understood in terms of overall numbers, population dynamics and behaviour. The regional population of lions in Southern Africa probably exceeds 19,000 individuals (Table 22).

-qns oN		Area	Lion range	Density of	ł	opulation siz	e	Assessment
population	COUNTY		surface (km ²)	lions/100km²	minimum	estimated	maximum	mode
	Tanzania	Mikumi National Park, Selous Game Reserve & Kilombero GCA	55,000	8.0	3080	4,400	5,720	С
		Southern Tanzania non-gazetted areas	45,000	1.2	378	540	702	C
35	Malawi	Liwonde National Park & surrounds	800	0.6	4	5	9	В
3	Mozambique	Nyassa Game Reserve	15,000	3.3	350	500	650	C
		Northern Mozambique non-gazetted areas	50,000	0.3	105	150	195	C
	Sub-total 25		165,800		3,917	5,595	7,273	
	DRC	Upemba & Kundelungu National Parks	19,330	0.3	35	50	65	С
26	Zambia	Sumbu complex (NPs & GMAs)	6,574	0.6	27	39	51	C
	Sub-total 26		25,904		62	89	116	
	Zambia	North & South Luangwa complex	40,814	4.0	1143	1,633	2,123	C
		Chisomo, Luano & West Petauke Game Management Areas	16,460	1.0	115	165	215	C
		Lower Zambezi National Park & Kariba shore areas	9,140	2.0	128	183	238	С
		Nyika National Park (Zambia side)	80	0.5				C
	Malawi	Nyika National Park (Malawi side) & Vwaza Marsh Wildlife Reserve	4,134	0.1	4	5	9	В
27		Nkhotakota Wildlife Reserve	1,500	0.7	8	10	12	В
		Kasungu National Park	2,000	0.3	4	5	9	В
	Zimbabwe	Mana Pools National Park, surrounding SAs & Communal Lands	13,000	3.8	396	495	594	В
		Matusadona & Chizarira National Parks, surrounding SAs & CLs	14,000	2.2	248	310	372	В
	Mozambique Sub-total 27	Tete Province and neighbouring regions	25,000 126,128	0.5	87 2,133	125 2,930	163 3,729	С
	Zambia	Kafue, Lochinvar & Blue Lagoon National Parks & surrounding GMAs	68,409	1.5	718	1,026	1,334	С
ar		West Lunga National Park & surrounding Game Management Areas	11,754	1.3	107	153	199	С
07	Angola	Kameia National Park & Moxico non-gazetted areas	24,450 104 613	0.4	69 60	98 775	121	С
	ond-total 20		CTO/FOI	0			1,001	đ
	Angola	Mavinga & Luiana Partial Reserves & Cuando-Cubango NGAs	29,350	0.8	165	235	305	0
	Zambia	Liuwa Plain & Sioma-Ngwezi National Parks & West Zambezi GMA	47,006	0.8	263	376	489	C
	Botswana	Okavango Delta (Moremi Game Reserve & Wildlife Manag. Areas)	14,741	11.5	1358	1,698	2,038	В
		Kwando/Chobe riverfront (Chobe NP & Wildlife Manag. Areas)	5,487	4.7	205	256	307	В
00		Dry North (Chobe NP & surrounding Wildlife Management Areas)	46,076	0.5	156	223	290	C
G	Namibia	Kaudom Game Reserve & Nyae Nyae	31,833	0.3	75	94	113	В
		Caprivi	24,937	0.7	144	180	216	В
	Zimbabwe	Hwange National Park	14,651	3.7	434	543	652	В
		Matetsi complex (inc. NPs, SAs & FL) & Gwayi complex	10,349	1.4	120	150	180	В
	Sub-total 29		224,430		2,920	3,755	4,590	

TABLE 22 - LION POPULATION STATUS IN SOUTHERN AFRICA

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(continued)

30	Mozambique	Zambezia Province: Gorongosa NP, Marromeu GR, Zambezi WUA & NGAs	19,970	0.5	70	100	130	C
	Mozambique	Gaza & Ihambane Provinces inc. Zinhave & Banhire National Parks	40,000	0.2	56	80	104	C
5	Zimbabwe	Gonarezhou National Park, Malipati Safari Area & Conservancies	9,027	2.0	128	183	238	С
10	South Africa	Kruger National Park & surrounding Game Reserves	22,000	11.5	2277	2,530	2,783	V
	Sub-total 31		71,027		2,461	2,793	3,125	
ç	Angola	Kangandala & Kisama National Parks, Luando Integral Reserve & NGAs	40,000	0.4	112	160	208	С
25	Sub-total 32		40,000		42	60	78	
	Angola	Iona, Mupa & Bikuar National Parks, Moçamedes Partial Reserve & NGAs	64,100	0.4	179	256	333	С
33	Namibia	Etosha National Park	17,500	1.8	252	315	378	В
ĉ		Kunene regions	38,819	0.3	82	102	20	В
	Sub-total 33		120,419			673		
	Botswana	Nxai Pan & Makgadikgadi NPs & Central Kalahari Game Reserve	68,530	0.7	315	450	585	С
		Kgakagadi Transfrontier Park & Wildlife Management Areas	61,200	0.9	522	580	638	A
34	South Africa	Kgakagadi Transfrontier Park	9,591	1.3	84	120	156	C
	Namibia	Kalahari						
	Sub-total 34		139,321		921	1,150	1,379	
	Zimbabwe	Tuli Safari Area	400	1.2	2	5	7	С
36	Botswana	Tuli Game Reserve	1,200	0.8	7	10	13	C
6	South Africa	Tuli						
	Sub-total 35		1,600		9	15	20	
Fenced Protec	cted Areas							
	South Africa	Mpumalanga			11	13	14	Υ
		Eastern Cape			107	119	131	A
		Free State			450	500	550	A
		Gauteng			182	202	222	A
		Kwazulu Natal			143	159	175	A
36		Northern Cape			19	21	23	Α
		Northern Province			49	54	59	A
		North West Province			121	134	147	A
	Swaziland	Hlane Royal National Park			17	19	21	A
		Nisela Safaris			7	8	6	A
	Sub-total 36				1,106	1,229	1,351	
12 sub-pop.	10 countries	Total	1,039,212		14,526	19,651	23,425	

(puə)

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SUB-POPULATION N° 25

Sub-population n° 25 appears to extend on the ground beyond the barrier of the Ruvuma River. Efforts are presently underway to set up a trans-frontier conservation area to join the Selous Game Reserve in Tanzania and the Niassa Game Reserve in Mozambique.

• Tanzania

The Selous ecosystem (Selous GR, Mikumi National Park, Kilombero Valley and surrounding non-gazetted areas) is one of the main strongholds of the African lion, perhaps the most secure of all.

The various observers (Rodgers, 1974; Creel & Creel 1997; L. Seige & R. Baldus, pers. comm.; P. Jonqueres & J-P. Bernon, pers. comm.; Ph. Chardonnet, pers. comm.) agree on the outstanding fitness of the lion status in the Selous ecosystem. All the large predator taxa of the region, including the lion, are abundant in the ecosystem.

In this region, poaching is limited, but problem animal control is carried out because of high incidence of man-eaters in this region (L. Seige & R. Baldus, pers. comm.).

• Mozambique

In the 1970's, Smithers & Tello (1976) were considering that "the lions have a wide distribution throughout Mozambique [...] they have a wide habitat tolerance...".

Being one of the few remaining true wilderness areas in Africa, the Niassa GR has not suffered the same level of wildlife losses as other Protected Areas further South and North. The surveys indicate that there are healthy populations of antelopes, lion and leopard in numbers constituting viable populations (Michler, 1998). The Niassa GR and its surrounding areas constitute an important conservation area for the lion (R. Taylor, pers. comm.).

The *Parque Nacional* das Quirimbas, presently under creation in the Cabo Delgado Province, seems to host an important population of lions. In 2001, 70 people were reported to have been attacked by lions while they were sleeping in their fields to protect them against crop raiding elephants (H. Motta, pers. comm.).

FIG. 2 - LION DISTRIBUTION AREA IN MOZAMBIQUE IN THE 1970'S (SMITHERS & TELLO, 1976)



• Malawi

Generally speaking, the lion population of Malawi is very low. Lions have become locally extirpated, or very nearly so, in all but one of Malawi's nine Protected Areas. All but one of Malawi's PAs would have held lion populations, or transient animals, at their time of proclamation. In virtually all areas of the lion's previous range in Malawi, wildlife prey populations have also declined drastically (T. Ferrar, pers. comm.).

As sub-populations become smaller and more isolated, inbreeding may become an issue. Lions are possibly increasing through immigration from Mozambique. Trans-boundary movement of individual animals is still taking place, albeit at a very low frequency (T. Ferrar, pers. comm.).

Illegal hunting of prey species in the Protected Areas, particularly snaring, has speeded the species decline by forcing animals to prey on livestock (T. Ferrar, pers. comm.).

SUB-POPULATION N° 26

• Democratic Republic of Congo

Even though DRC is geographically seen to be part of Central Africa, Southern lion populations of DRC have been incorporated into the Southern Africa Region because they are connected with lion populations of Southern Africa and not with those of Central Africa.

Upemba and Kundelungu National Parks comprise just over 19,000 km² of Protected Areas and, by adding the other gazetted areas, so-called *Zone Annexe* and *Domaines de Chasse*, the entire ecosystem reaches 3 million hectares in size. The habitat there is suitable for lions, but their density is very low and a tentative estimate of 50 individuals is given for all these areas together.

In the early 1990's, D'Huart (1991) was considering that lions had disappeared from Upemba in 1985. Today, lions are observed there several times a year and their population is estimated between 10 and 15 (F. Bateshi Murotsi, pers. comm.). In the now contiguous Kundelungu a few individuals may remain as well (Nkulu Kalala, pers. comm.). According to B. Chardonnet (pers. comm.) who worked there in mid-2002:

- the lion's prey species appear to be rare and shy in the region, with a few exceptions such as southern reedbuck, oribi and warthog, and;
- it is highly doubtful there are as many as 50 lions in the whole region including surrounding non-gazetted areas.

• Zambia

The Mweru Wantipa and Sumbu National Parks have few lions as game populations have been massively reduced by poaching (C. & T. Stewart, 2001).

Zambia is one of the few remaining countries where lions are still widespread and regularly encountered close to human settlements. However, the distribution of lion outside the National Parks and the GMAs has undoubtedly dwindled significantly as a result of persecution and habitat degradation (R. Jeffery, pers. comm.).

SUB-POPULATION N° 27

• Malawi

Lion populations are very low. They have become locally extirpated, or very nearly so, in all but one of Malawi's nine Protected Wildlife Areas. Historically only one of Malawi's PAs would not have held lion populations, or transient animals, at their time of proclamation. In virtually all areas of the lion's previous range in Malawi, wildlife prey populations have also declined drastically due to illegal hunting. This has speeded the species decline by forcing animals to prey on livestock.

Only one sub-population is currently breeding well, namely that in Nkhotakota Wildlife Reserve. There are no estimates of frequency or survival rates of cubs, but young, or spoor of young, are occasionally seen. The lion population is probably stable in the short term.

In Kasungu National Park, only a single animal is known to occur in this Park.

In Nyika National Park and Vwaza Marsh Protected Area, lion populations are declining. Occasional visiting lions from Zambia enter these Protected Areas.

• Zambia

Historically, lion occurred throughout Zambia. Today, lions are still found more or less throughout the country, with a propensity for their occurrence in the larger more remote Protected Areas such as the North and South Lungwa, Lower Zambezi, etc. and their surrounding Game Management Areas, with higher densities occurring inside the National Parks (R. Jeffery & J.J. Pope, pers. comm.). However, Ansell (1978) noted that even where lions are no longer resident, they might still occur sporadically as transient individuals or groups.

Few contemporary density or population data are available for these or any other areas, although it may be assumed that densities of lion populations decrease with distance from the major rivers and floodplains of these refuges, except in the immediate areas surrounding permanent water, reflecting the relationships between the numbers and sizes of prides, the densities of resident concentrations of 'plains game' or prey species, and availability of water. In some areas it may well be that lion numbers are also affected by the hunting success of competing predators such as hyena.

The Luangwa complex may be considered as one of the main stronghods for the taxon in the whole coninent with a population presumably close to 1,500 lions.

In the early 1990's detailed studies have been carried out in the Nsefu Sector of South Luangwa National Park and the adjoining riverine part of the Upper Lupande Game Management Area totalling 355 km². "*The number of lions in the Hunting Block was estimated at 410* +/- 48 with 205 adults including 40 +/- 5 adult males" (Jachmann, 2001).

There are no lions resident in Kasanka National Park, nor it seems in Lavushi Mande National Park. The last sighting of lion in Kasanka NP was of three animals in 1996, and it is felt that they came from the nearby Congo D.R. where human population is very low (C. & T. Stewart, 2001).

• Zimbabwe

In Mana Pools National Park, surrounding Safari Areas and neighbouring Communal Lands, lion populations are probably stable in Protected Areas, but decrease in the Communal Lands as a result of habitat loss (N. Monk, pers. comm.; G. Purchase, *in prep.*).

Lions in the un-flooded Middle Zambezi Valley are reproducing well (N. Monk, pers. comm.) even though no information is available on the factors that are influencing reproduction (V. Booth, pers. comm.).

In Matusadona National Park, lion numbers increased from 1990 to 1998 with a growing number of buffalo in the park, as drought years expanded the area of lakeshore grassland due to the drop of the lake level (G. Purchase, pers. comm.). Today the lion population is

estimated at around 110 with an average pride size of 11 (F. Buyeye & G. Matipano, pers. comm.).

Lion numbers are possibly stable in other Protected Areas, but wildlife poaching appears to be very common in Chirisa Safari Area, and so lion numbers may have decreased even though data are not available (V. Booth, pers. comm.). Lion numbers probably decreased in the Communal Lands during the past 22 years as a result of habitat loss (V. Booth, pers. comm.).

Lions of the Sebungwe region are reproducing well (G. Purchase, *in prep.*), but no information is available on the factors that are influencing reproduction.

According to R. Taylor (pers. comm.), the lion population on the shores of Lake Kariba:

- Had increased in 2000-2001 because the weakness of buffalo made them an easier prey; this was due to the flooding of the grasslands along the shores of lake Kariba, but;
- Is starting to drop in 2002 with the decrease of buffalo populations and therefore less available prey (lion infant mortality has been observed).

"A good example of the destruction and recovery of a lion population can be seen from the Zambezi Valley. After years of heavy hunting pressure, a "cat flu" epidemic has wiped out around 75% of the lions, and a VIP hunting scam removed a further 16 male lions just after the epidemic has passed its peak...Furthermore, the buffalo and impala populations crashed because of the lake and the hyena numbers built up to high levels...I seriously doubt that the carrying capacity for lion is more than half of what it was in 1985...My personal assessment of the Zambezi valley is that the lion population is recovering nicely. Numbers have built up to the point where they are beginning to club the hyena population into some semblance of normality...Also pride structure has begun to "normalise" (Heath, 2001).

• Mozambique

The Tete Province definitely has a substantial resident population of lions, however reliable numbers are not known. It shares lions with neighbouring Zimbabwe and Zambia. Hunting safari companies operate in the Province with uneven success as far as lion is concerned.

SUB-POPULATION N° 28

• Zambia

The sub-populations no[°] 28 and no[°] 29 are considered as separate populations here because they occur on opposite banks of the Zambezi River. While there may occasionally be crossover, this river represents a formidable barrier and as such these two populations are considered accordingly.

There is considerable variation throughout the Protected Areas system in Zambia. This population occurs in some 80,000 km² of suitable habitat comprising approximately 25,000 km² of National Parks and 55,000 km² of Reserves or Hunting Areas. Kafue National Park has high densities of lions, particularly around the river valleys where prey species are still

plentiful, particularly in the Busanga Plains, possibly as high as 20 per 100 km² in some places (R. Jeffery & J.J. Pope, pers. comm., 2002).

Elsewhere the densities are much lower in the West Lunga National Park and Lochinivar and Blue Lagoon National Parks are unlikely to support significant populations of lion (R. Jeffery & J.J. Pope, pers. comm.; Mitchell, Shenton & Uys, 1965).

• Angola

Little is known about the status of lions in Angola. Sub-population n° 28 occurs in Kameia National Park, an area of 14,450 km² and its surrounding non-gazetted area known as Moxico which is a further 10,000 km². A tentative estimate of 98 animals is given for the population size.

The status of lions in Angola as a whole is poorly understood. "*Crude estimates for some regions of the country do exist, but these, however, are not based on scientific surveys*" (W. van Hoven, pers. comm., 2002).

SUB-POPULATION N° 29

• Zambia

This population occurs in an area of approximately 9,000 km² of Liuwa Plain and Sioma-Ngwezi National Parks and a further 38,000 km² of Protected Areas (West Zambezi GMA). Lion densities in these areas are considered to be relatively low with a currently estimated lion population of 376 individuals (R. Jeffery & J.J. Pope, pers. comm.).

• Angola

There is a little known area comprising over 14,000 km² made up of Mavinga and Luiana Partial Reserves and Cuando-Cubango non-gazetted areas covering 15,000 km². The exact status of lions in these areas is not clear and hence their population estimate of 235 should be viewed with caution.

• Namibia

Reliable information on lion in Namibia is available from Stander (1997), Stander & Hanssen (2001), Loveridge, Lynam & Macdonald (2001). There may be between 500 and 1,000 lions in the whole country (465-914; V. Booth, pers. comm.).

In Caprivi, the past trends and present status of the lion population is poorly known. There are probably between 125 and 234 individuals. The wildlife habitat there is on the decrease due to livestock negative impact and civil unrest. There is some livestock depredation by lion in the Eastern Caprivi. In this region the mean annual quota is 1.4-2.8% of the lion population (1996-2001) and a stable average of 7.2 lions are trophy-hunted per year over the past 5 years.

In Kaudom Game Reserve the lion population is stable and a similar situation seems to occur now in Nyae Nyae after a recent decline (Stander, 1997). In Kaudom the mean annual quota is

0.7-2.2% of the population (1997-2001) and direct benefits are allocated to communities in the form of financial payments to conservancies.

• Botswana

It is safe to say that the Northern Botswana lion population (lions from Nxai Pan National Park and Makgadikgadi National Park excluded) is larger than 2,000 animals (Sechele & Winterbach, 2001).

The lion population of the Okavango is stable. Surveys were conducted in 1998 and 1999, supported by monitoring population dynamics of five prides for the period 1997 - 2001 (P. Funston & C. Winterbach, pers. comm.). The Okavango Delta lion range is made up of an area of 7,084 km² of high density (between 7.2 and 19.1 adults and sub-adults per 100 km²) and of another area of 7,676 km² of lower density (between 0.8 and 5.9 adults and sub-adults per 100 km²) (Sechele & Winterbach, 2001).

There is little data for the Dry North, but hunting pressure may be resulting in local declines. The lack of dry season prey in that area is the limiting factor in lion populations (P. Funston & C. Winterbach, pers. comm.).

A recent study (Neo-Mahupeleng *et al.*, 2001) was undertaken in the North-eastern tip of Botswana, along the Chobe River, in an area of about 245 km². According to the study, 45 lions occurred in the area with a outstandingly high adult density ranging between 21 and 37 individuals per 100 km².

On the Kwando/Chobe riverfront, populations are stable to declining. In 1999 and 2000 a survey showed a low proportion of sub-adults, indicating a low recruitment of cubs in the subpopulation (P. Funston & C. Winterbach, pers. comm.). In this particular area, the relatively small lion population (with a low density of 0.61 lion per 100 km²) is more vulnerable to disruption (Sechele & Winterbach, 2001). Normal population structures have been recorded during lion surveys in the Okavango Delta (1998 and 1999) and local surveys in parts of the Delta (1995 - 2000) and there is a large robust population.

• Zimbabwe

The stronghold of the Zimbabwe lion population lies in the Western corner of the country (North-West Matabeleland) in Hwange National Park, Matetsi complex and Gwayi complex, where the lion numbers are currently probably stable (V. Booth, pers. comm.).

In Hwange NP the lion population has been assessed on several occasions since 1928, when the park was launched:

- In 1973 it was estimated that the lion population in Hwange National Park was about 500 animals (Wilson, 1975);
- In 1989, some 16 years later, the same figure of 500 was quoted by Jones (1989 *in* Wilson, 1997);
- By 1997 it had grown; "...the lion population in the entire Hwange N.P. could not be less than 1000 animals...the population figure should be regarded as an educated guess" (Wilson, 1997), and;



Tanzanian lions, Selous Game Reserve (Photo : O. Buttin).



South African lion, Kruger National Park (Photo : B. Chardonnet).



South African lion, Kruger National Park (Photo : B. Chardonnet).



South African lion, Madikwe Wildlife Reserve (Photo : B. Chardonnet).



South African lioness, Kruger National Park (Photo : O. Buttin).

- In 2002 a study is currently being undertaken on the lion population of the Park and the population size is reaching 543 individuals with the following composition (Loveridge, 2002): 50 adult males, 250 adult females, 94 sub-adults, 199 cubs.

In the Gwayi complex, immigration from the neighbouring Hwange NP is the most likely source of replenishment (V. Booth, pers. comm.), since a very high quota of 37 male lions is attributed for a relatively rather small hunting area (Loveridge, 2002).

Lion number is probably stable in Hwange NP (V. Booth, pers. comm.). In the Matetsi complex, the lion population has been heavily hunted since 1973 and has been subject to heavy hunting to control stock killing lions (V. Booth, pers. comm.). In the Gwayi complex, the switch from cattle to wildlife production in the 1980's halted decline in lion populations (V. Booth, pers. comm.).

SUB-POPULATION N° 30

• Mozambique

Information from Mozambique is understandably sketchy and the effects of twenty years of conflict on the lion populations are yet to be researched. "*We don't have any idea how many lions are left in Mozambique*" (W. van Hoven, pers. comm., 2002).

According to Smithers and Tello (1976) in the 1970's, "wanderers (lions) make their way, probably from the populations resident tin the Gorongoza National Park and surrounding areas, where they are abundant, westwards, over the Zimbabwe border, where they occur from time to time between 18°S and 20°S and from the Save River area north-westwards from 20°S to 20°30'S. These wanderers may become raiders of domestic stock and, when subject to hunting pressure, normally make their way back whence they came."

Lower Zambezi valley, Gorongosa NP, Marromeu Game Reserve, Zambezi Wildlife Utilisation Areas and surrounding non-gazetted areas consist of nearly 20,000 km² of available lion habitat most of which is Hunting Areas (10,000 km²) or non-gazetted areas (6,120 km²). A very tentative estimate of 100 animals has been given for this population.

It remains doubtful whether this sub-population is really separated from the sub-population n° 27 (P. Jonquères, pers. comm.)

SUB-POPULATION N° 31

• Mozambique

In the 1970's Smithers and Tello (1976) were stating: "The lions have become extinct in the eastern parts of the Inhambane Province where, until 1950, they were known just South of the Save River and until 1966 just East of the Cabo de S. Sebastiao. They no longer occur in the Maputo Province, except as vagrants from the Transvaal which move eastwards to near Magude and into the extreme Southern parts of the Province from time to time."

Gaza and Inhambane Province lion range covers about 40,000 km² of which 12,000 km² are made up of Zinhave and Banhire National Parks, the remaining 28,000 km² being non-gazetted lands. A cautious figure of 100 lions is provided here.

• Zimbabwe

In Zimbabwe this sub-population is tentatively put at approximately 180 with wide confidence limits (high 238 – low 128). Found mainly in Gonarezhou NP, Malapati Safari Area and Conservancies, an area of 5,053 km² of National Park and 3,970 km² of other Protected Areas (N. Monks, S. Clegg, A. Pole, V. Booth, pers. comm.; Pole, 2000).

Lions in the South-East Lowveld are reproducing (S. Clegg, pers. comm.), but no information is available on the factors that are influencing reproduction. There was most probably an increase in lion number after cattle ranches were converted to wildlife conservancies during the early 1990s (V. Booth, pers. comm.).

• South Africa

The Kruger National Park and surrounding populations are probably stable with fluctuations due to environmental conditions.

Past trends of Kruger NP and surroundings are unknown, but lions were virtually exterminated at the beginning of the 19th Century. Future trend predicted for Kruger and surrounds is stable with fluctuations, provided conservation measures continue to be employed.

There is great concern regarding the future of the lions in Kruger due to the high incidence of Bovine Tuberculosis (introduced by neighbouring cattle and spread by buffalo) which jeopardizes their general health and status (R. Bengis, pers. comm.).

The normal recruitment rate for Kruger NP and surroundings is about one cub/adult lioness/year on average. (G. Kamasho, G. Van Dyk, J. Kruger, D. Balfour, A. Shulto-Douglas, F. Funston, R. Slotow & V. Booth, pers. comm.).

SUB-POPULATION N° 32

• Angola

In the region of the *Reserva do Luando*, the lion was considered as widespread but never abundant. They had become rare in the 1970s (Silva, 1972).

SUB-POPULATION N° 33

• Angola

Lions were abundant in the 1960s in the Kuando-Kubango hunting concessions, in the Southeastern corner of Angola (B. des Clers, pers. comm.).

• Namibia

According to P. Stander, Carnivore Co-ordinator at the Ministry of Environment & Tourism of Namibia, the lion population of Etosha National Park is stable and has been so for the last 15 years. This is where most of the Namibian lions occur and the density in the park is quite high with 1.8 lions per 100 km² (Stander, 2000).

Lions in the Etosha NP have a potential growth rate of 10%, excluding violent mortalities (P. Stander, pers. comm.). However, in the longer run, the sustainability of this population is said to be somehow uncertain because of "*a shortage of scientific data on the ecological mechanisms that drive population regulation*". A peculiarity of the Etosha lions is that they appear to be free from the Feline Immunodeficiency Virus, which seems to be widespread among lions elsewhere (Cat News 24, 1996).

However the Etosha lions are subjected to constant persecution of lions by farmers in the intensive cattle farming areas along the Park's borders further to livestock losses (Stander, 2000). Between 1985 and 2000, 427 lions from Etosha were thus destroyed on the borders of the Park (Stander, 2000). Over the past 19 years an average of 28 lions have been shot along the border, this number has remained constant (V. Booth, pers. comm.). According to Cynthia Vernon (Vernon, 1996), "these killings may have significant effects on the demography of Etosha lion population. About one-half of the mortality of adult lions is the result of the killing of lions on private lands. Of all lions killed, approximately 50% are sub-adults males. Therefore, there is a question as to the genetic and demographic prognosis for small isolated populations".

The Kunene population is stable and has a potential growth rate of 10% (excluding violent mortalities) despite the extremely arid environment of the area, but its past trend is unknown (V. Booth, pers. comm.). "Lions have always existed in the Kunene region, but their ecology and demography have never been studied" (Hanssen & Stander, 2000). P. Stander and Lise Hanssen, Director of the Africa Cat Foundation, have initiated a study on the large carnivore of the Kunene region in 1999. Community conservation programmes such as communal conservancies are currently in place, notably to monitor and promote suitable habitat for lions.

SUB-POPULATION N° 34

Because of the harsh semi-desert conditions of the area, the Kalahari lions differ in many ways from other African lion populations, not in their appearance but in their behaviour. Their way of hunting and water consumption are unique. The size of their prides seldom exceeds 16 animals, in contrast, in Kruger NP, 40 lions were once counted in a single pride. The Kalahari lions have also the highest mortality rate among cubs in all of Africa (Cat News 26, reproduced from Custos 1997).

• Botswana

The Makgadikgadi National Park has a small [39 (28-59), 95% confidence] population of lions that lives at a quite low density (0.8 adult and sub-adult lion per 100 km²) (Hemson, 2001). The lion population of the Pans region is stable. However, this sub-population is locally threatened due to predator-human conflict that had a high impact on the small sub-population. The Southern Kalahari population is probably stable with fluctuations due to environmental conditions (Funston, 2001).

Past trends of the Southern Kalahari prides are unknown, but lions were virtually exterminated on the South African side of the Park (P. Funston & C. Winterbach, pers. comm.).

The Pans region shows a rapidly decreasing populations due to high level of conflict and problem animal control. However, future trends in the Pans indicate that populations are expected to increase after the ban on Problem Animal Control was implemented in November 2000. The Southern Kalahari population is expected to remain stable, provided that conservation measures continue to be employed (P. Funston & C. Winterbach, pers. comm.).

• South Africa

Quite reliable figures on lion's status in South Africa are available from G. Kamasho, G. Van Dyk, J. Kruger, D. Balfour, A. Shulto-Douglas, F. Funston, R. Slotow & V. Booth, pers. comm.; Mills, Wolf, Le Riche & Meyer, 1978; Funston, 2001.

In recent history the Kgalagadi Trans-frontier Park lion population was virtually exterminated on the South African side of the park. However, this population (the Kgalagadi Trans-frontier Park population) is predicted to remain stable, providing conservation measures continue to be employed. The normal reproductive rate for the Kgalagadi Trans-frontier Park is about one cub/adult lioness/year on average.

• Namibia

There appears to be no mention of any lion on the Namibian side of the Kalahari Desert by such authorities as P. Stander.

SUB-POPULATION N° 35

• Zimbabwe

In Zimbabwe there is a very small population in the Tuli Safari Area, a Hunting Block of 400 km² South of the country. The population spans three international borders and is tentatively put at 5 animals.

• Botswana

On the Botswanan side of the border this populations has 1,200 km² of habitat available in the Tuli Game Reserve and the estimated population is 10 individuals. This figure has not been reliably confirmed.

• South Africa

No information was available for the South African side of the border where this subpopulation is concerned.

SUB-POPULATION N° 36

• South Africa

Accurate figures for enclosed lion populations in South Africa originate from Van Schalkwyk, 1994; W.& S. van Hoven, pers. comm.; G. Kamasho, G. Van Dyk, J. Kruger, D. Balfour, A. Shulto-Douglas, F. Funston, R. Slotow & V. Booth, pers. comm.

The lion populations found in South Africa can be characterised as being the most intensively managed populations in Africa. This highly interventionist approach has produced a wealth of useful information on the management of small populations and demonstrates just what can be done when there are sufficient resources and the will to carry out these projects. However, it also highlights the fact that this type of management is extremely difficult and it is better to never lose lions from an area than to try and re-introduce them having lost them in the first place, as it is unlikely that the monumental efforts that have gone into lion management in South Africa could be repeated across the continent.

In South Africa, there are a number of enclosed populations of lions which are not included here as sub-populations. The populations given in the present survey consist only of free-ranging animals and those that have been re-introduced under strict conditions to areas where they occurred historically or other reasons, for instance:

"Lions were introduced into Pilanesberg National Park because the species was identified as a major draw-card for foreign tourists in particular and a crucial component for the socioeconomic development of the region...A highly interventionist approach towards lion population management was adopted.... Lions have made a significant contribution to the park in direct economic returns from increased tourism, live sales and hunting." (Van Dyk, 2001).

The current status of these populations is given as:

- The Mpumalanga Parks lion population is declining;
- The North West Parks meta-population is increasing;
- The Hluhluwe-Umfolozi population is slowly decreasing, but Kwazulu Natal Wildlife started an introduction programme since 2000 and population is starting to increase, and;
- The Phinda, Kwandwe and Shamwari populations are increasing.

Their history is particularly important, given the intensive nature of their management:

- Both Madikwe and Pilanesberg populations were reintroduced from Etosha stock (22 founders);
- Before the recent introduction, the Hluhluwe-Umfolozi population's trend has been from stable to slowly declining. There have been 3 bottlenecks:
 - (i) Small founder population introduced in the 1960s;
 - (ii) During the 1980 drought years, herbivores were heavily culled. By the mid-1980s lions needed to be reduced because their numbers had increased to 200, and;
 - (iii) Sub-adults started escaping and a policy was implemented to reduce these groups for the sake of good neighbour-relations. Consequently, pride males stayed too long in the pride and started breeding with their daughters and inbreeding resulted.

The original Phinda introductions were from the Sabi Sands while Kwandwe and Shamwari founder populations were from the Pilanesberg/Madikwe meta-population and are both very recent introductions, i.e. the last 18 months.

The future of these animals is not clear due to the mixed fortunes of the various groups:

- The outlook for Mpumalanga Parks does not look good. Disease, habitat fragmentation and destruction (due to unprecedented development), hunting and poaching (snaring, shooting from the road) are having a significant impact;
- The North West population has proved so successful that dozens of the progeny of the two populations have been relocated across the sub region (Mabula, Entabeni, Welgevonden, Shambala, Shamwari, Kwandwe and Hluhluwe-Umfolozi). A group was also made available to Oklahoma City Zoo and a game reserve in Zimbabwe;
- It is probably too early to tell whether the Hluhluwe-Umfolozi, Kwandwe and Shamwari introduction programme will be successful, and;
- The Phinda population is maintained at 15 16 lions, which is assumed to be the correct carrying capacity for a reserve of this size.

Interestingly their reproductive history is well documented:

- In Mpumalanga Parks, the Low-Hills population is doubling each year while the Mthetamusha population is stable;
- Rapid growth within the Pilanesberg/Madikwe populations has resulted in the implementation of population control (contraception) being applied in the form of vasectomies. Vasectomies are used to manipulate the genetic composition of the population as well;
- Of the three males and three females introduced to Hluhluwe-Umfolozi Park in 2000, one female was killed and the two others have produced two cubs each. Two of the males moved south and have joined up with existing prides, and;
- The Phinda lions have done very well and are on the increase. Both Kwandwe females are pregnant. Shamwari has experienced cub mortalities and one theory is that this may be due to male vasectomies in the founder population.

			Lion	Lion	Main pre	y for lions	Conservation	
N ^o sub-	Country	Area	population trend	habitat quality trend	Wildlife	Livestock	efficiency (rate 0 to 3)	Lion conservation constraints
	Tanzania	Mikumi NP, Selous GR & Kilombero GCA	s	s	Х	Х	3	
		Southern Tanzania non-gazetted areas	s	S	Х		2	predation on humans
25	Malawi	Liwonde National Park & surrounds	Ι	S	Х		2	small population size, scarcity of prey
	Mozambique	Nyassa Game Reserve	s	S	Х		Э	
		Northern Mozambique non-gazetted areas			Х			agriculture
36	DRC	Upemba & Kundelungu National Parks	D	D	Х		1	agriculture, poaching
07	Zambia	Sumbu complex (National Parks & surrounding GMAs)			Х			
	Zambia	North & South Luangwa complex	s	s	Х		Э	
		Chisomo, Luano & West Petauke GMAs		S	Х			
		Lower Zambesi National Park & Kariba Shore	s	D	Х		2	agriculture, settlement
		Nyika National Park (Zambia side)			Х			
ľ	Malawi	Nyika NP (Malawi side) & Vwaza Marsh WR			Х			small population size, scarcity of prey
17		Nkhotakota Wildlife Reserve			Х			small population size, scarcity of prey
		Kasungu National Park			Х		2	small population size, scarcity of prey
	Zimbabwe	Mana Pools NP, surrounding SAs & Communal Lands	S	S	Х		З	agriculture, settlement
		Matusadona & Chizarira NPs, surrounding SAs & CLs	s	D	Х	Х	3	agriculture, livestock
	Mozambique	Tete Province			Х	Х	1	agriculture, settlement
	Zambia	Kafue, Lochinvar, Blue Lagoon NPs & surrounding GMAs	s		Х		2	
28		West Lunga National Park & surrounding GMAs			Х			
	Angola	Kameia National Park & Moxico non-gazetted areas			Х			civil unrest, poverty
	Angola	Mavinga & Luiana PRs & Cuando-Cubango NGAs			Х			civil unrest, poverty
	Zambia	Liuwa Plain, Sioma-Ngwezi NPs & West Zambezi GMA			Х			
06	Botswana	Northern Botswana	s	S	х	х	3	
à	Namibia	Kaudom Game Reserve & Nyae Nyae	S	S	Х	Х	2	livestock
		Caprivi			Х	Х	1	livestock
	Zimbabwe	North-West - Matabeleland	S	S	X	X	б	agriculture, livestock

TABLE 23 - TRENDS AND CONTRAINTS IN LION CONSERVATION IN SOUTHERN AFRICA

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(continued)

MozambiqueGaza & Ihambane Province inc. Zinhave & Banhire NPsMozambiqueGaza & Ihambane Province inc. Zinhave & Banhire NPs31ZimbabweGonarezhou NP, Malipati Safari Area & Conservancies S/D 1 X 32Nouth AfricaKruger National Park & surrounding Game Reserves S/D 1 X 33AngolaKangandala & Kisama NPs, Luando IR & NGAs S/D 1 X 33NamibiaEtosha National Park $Kisama NPs, Luando IR & NGAs$ S X 33NamibiaEtosha National Park S_NGAs S S 34BotswanaCentral Botswana S S S S 34South AfricaKgakagadi Transfrontier Park S S S S S 35BotswanaTuli Game Reserve S S S S S 36South AfricaTuli Game ReserveTuli Game Reserve S S S 36South AfricaSouth AfricaSouth Africa S S S 35BotswanaTuli Game Reserve S S S S 36South AfricaSouth AfricaSouth Africa S S S 36South AfricaSouth AfricaSouth Africa S S S 37South AfricaSouth Africa S S S S 37South AfricaSouth Africa S S S S 38South AfricaSouth Africa <td< th=""><th></th><th></th><th>v</th><th>I agriculture, livestock</th></td<>			v	I agriculture, livestock
31ZimbabweGonarezhou NP, Malipati Safari Area & Conservancies S/D I X 32South AfricaKruger National Park & surrounding Game Reserves S/D I X 33AngolaKangandala & Kisama NPs, Luando IR & NGAs S/D I X 33NamibiaEtosha National Park X NGAs X X 33NamibiaEtosha National Park X NGAs X X 34BotswanaCentral Botswana S S S X 34South AfricaKumene regions S S S S 34NamibiaKumene regions S S S S 35BotswanaKgakagadi Transfrontier Park S S S S S 36South AfricaTuli Game ReserveTuli Game Reserve S S S S 36South AfricaTuli Game ReserveTuli Game Reserve S S S S 36South AfricaTuli Game ReserveTuli Game Reserve S S S S 36South AfricaTuli Game ReserveS S S S S S 36South AfricaSouth AfricaSouth AfricaS S S S 37South AfricaTuli Game ReserveS S S S S 38South AfricaTuli Game ReserveS S S S S S 37Sout		Х	Х	1
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34 Kunene regions S X 34 Botswana Central Botswana S S X 34 South Africa Kakagadi Transfrontier Park S S X X 35 Botswana Tuli Safari Area S S S X X 35 Botswana Tuli Game Reserve Tuli Game Reserve Y Y Y Y 36 South Africa Tuli S S S Y Y 36 South Africa South Africa S S S Y Y 36 South Africa South Africa S S Y Y Y	s	Х	x	3 livestock, settlement
Botswana Central Botswana S <td></td> <td>Х</td> <td>Х</td> <td></td>		Х	Х	
34 Southern Botswana S S S S 34 South Africa Kgakagadi Transfrontier Park S S S Namibia Kgakagadi Transfrontier Park S S S S 35 Botswana Tuli Game Reserve S S S 36 South Africa Tuli S S S	S	Х	Х	3 agriculture, livestock, mining
36 South Africa Kgakagadi Transfrontier Park S S X 1 Namibia Kgakagadi Transfrontier Park S S X 35 Botswana Tuli Safari Area X S S S 36 South Africa Tuli S S S S S 36 South Africa Tuli S	s	Х	x	3 livestock, over-harvest. of springbok
Namibia Kgakagadi Transfrontier Park N Zimbabwe Tuli Safari Area X 35 Botswana Tuli Game Reserve X South Africa Tuli South Africa South Africa 36 South Africa South Africa South Africa	S	Х	x	3 livestock
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36 South Africa S S S X Swaziland S S S S S S S S S S S S S S S S S S S		Х		
Swaziland	S S	Х		3
		Х		

I = increasing S = stable

D = decreasing

Rate 0 to 3: 0=low; 3=high No information = missing or insufficient data

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