Summary of Results of the

LARGE CARNIVORE SEMINAR 15-16 NOVEMBER 2006
AND SUBSEQUENT TRAINING COURSE 17-18 NOVEMBER 2006
CEDC, MAROUA, CAMEROON
ECOLE DE FAUNE, GAROUA, CAMEROON

Organized by
Institute of Environmental Sciences (CML), Leiden University, the Netherlands,
Centre d'Etude de l'Environnement et du Développement (CEDC), Cameroon and
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SUMMARY

The present report covers the results of an international seminar and training course on large carnivores in West and Central Africa. It includes abstracts of the different presentations at the Large Carnivore Seminar, which was organised by the Centre for Environment and Development studies in Cameroon (CEDC) and the Institute of Environmental Sciences in Leiden (CML) in Maroua on 15 and 16 November 2006. In addition a training course for students of the Ecole de Faune in Garoua (EFG), organised on 17 and 18 November 2006 and a field training on the use of calling stations during 19-21 November 2006. The seminar was organised in close collaboration with the Regional Network of Lion Experts in West and Central Africa (ROCAL) and the African Lion Working Group (ALWG). A total of 16 carnivore experts from West, Central, East and Southern Africa presented a paper during the seminar. Some 40 participants attended the seminar. Among the participants were the Netherlands Ambassador Mr. Norbert Braakhuis and staff of the Ministry of Foreign Affairs of the Netherlands, Mr. Fons Gribling. The presentations covered the management and conservation of large carnivore populations in West and Central Africa, with a main focus on lion, hyena and wild dog. Info0rmation on cheetah and leopard was included in some of the presentations. The two day training course was attended by some 34 students of the Ecole de Faune in Garoua and had a main focus on large carnivore management and conservation. During 20 and 21 November an associated field training was carried out in Benoue National Park on the use of calling stations and a sedation rifle for the GPS collaring of lions, coordinated by Dr. Paul Funston.

The seminar resulted in the presentation of the ***Regional Lion Conservation Strategy for West and Central Africa*** to the Governor of the Extreme North province of Cameroon. The seminar also resulted in the launching of the regional ***Lycaon Initiative for West and Central Africa.*** It is the intention to publish the papers presented at the seminar in proceedings during the course of 2007. The organizers express their gratitude to the sponsors, including the Netherlands Committee for IUCN (IUCN NL), The Vereniging van Dierentuinen, Prins Bernhard Natuurfonds and the Van Tienhoven Foundation.

INTRODUCTION

Throughout sub-Saharan Africa, human settlements and associated agriculture and livestock systems are increasingly expanding into natural savanna regions. Interactions between livestock and large carnivores in these areas are often causing significant economic losses for livestock owners. At the same time, poaching in response to depredation of livestock has resulted in a significant reduction and fragmentation of large carnivore populations. These and other threats, such as a decrease in prey numbers and habitat destruction, pose a great pressure on the remaining populations of large carnivores such as lion, wild dog and cheetah. Especially during the past few decades, an urgent need for the effective protection of these large carnivores, including ways to prevent or mitigate conflicts with human populations, has therefore become evident.

The conservation of large carnivore populations can only be accomplished successfully if conservationists throughout the continent work closely together and exchange information on all aspects of large carnivore conservation. In order to provide conservationists from West-, Central, Eastern and Southern Africa with exactly such an opportunity, the Institute of Environmental Sciences (CML) of Leiden University together with the Centre for Environment and Development studies in Cameroon (CEDC) initiated the organisation of a Large Carnivore Seminar in Maroua, Cameroon. The venue of the seminar was at the CEDC in Maroua. The CEDC has been established as the result of a cooperative agreement between the ex-Ministry of Higher Education, Computer Science and Scientific Research (ex-MESIRES) in Cameroon and the Rector of the University of Leiden in the Netherlands. The seminar was organised in close collaboration with the Regional Network of Lion Experts in West and Central Africa (ROCAL) and the African Lion Working Group (ALWG). The training course was organised in collaboration with the Ecole de Faune in Garoua. During 20 and 21 November an associated field training was carried out in Benoue National Park on the use of calling stations and a sedation rifle for the GPS collaring of lions, coordinated by Dr. Paul Funston.

Financial support for the seminar and training course was received from IUCN-NL (through ROCAL), Vereniging van Dierentuinen, Van Tienhoven Stichting and Prins Bernhard Natuurfonds.

In total, 16 researchers from 9 countries (The Netherlands, Benin, Chad, Niger, Equatorial Guinea, Cameroon, Kenya, Zimbabwe and South Africa) were invited to present 18 scientific papers and to discuss various aspects of large carnivore conservation during the 2-day seminar in Maroua. Some 40 participants attended the seminar. In addition, the Lion Conservation Strategy for West and Central Africa was presented to the Governor of the Extreme North Province in the presence of His Excellency the Ambassador of the Netherlands to Cameroon, and all participants. The aim of the strategy is to assure the sustainable conservation and management of the lion in West and Central Africa. The subjects addressed during the seminar were diverse, most focussing on carnivore-livestock conflicts which is considered to be of the highest conservation priority for lions, but conservation management of other large carnivores, most importantly wild dog and cheetah, were also discussed. It became evident from the majority of the presentations that large carnivore conservation should not only incorporate aspects of carnivore ecology but should equally involve the development of strategies for the improvement of socio-economic standards in local communities, especially where carnivores are causing problems by depredating on livestock. The seminar programme is found in annex I, the programme of the training course in annex II.

In order to provide a general overview of the results of the seminar, 14 presentations are summarized below.

SUMMARY OF PRESENTATIONS LARGE CARNIVORE SEMINAR CEDC 2006

Lion conservation strategy in West and Central Africa

Saleh Adam
MINFOF/PNW, Cameroon

Studies conducted during the past two decades show that lion population numbers have declined with approximately 30-50%, which has resulted in it being classified as Vulnerable on the Red List of Threatened Species of the IUCN. The species is most threatened in the West and Central African region, which harbours approximately 10% of the continent's lion population. The need for a more effective strategy to protect lions in West and Central Africa was expressed during the exchange of information at a workshop in Limbé, Cameroon in 2001. A workshop organized the next year in Garoua led to the development of a network of lion specialists in the West and Central African region. These workshops further revealed the need for the establishment of conservation strategies for lions at the regional level in order to solve problems in several countries and to improve the management of transfrontier populations. The current status of the lion has drawn international attention during the third Conference of Parties of CITES (COP 13) in October 2004. It was proposed to change the status of the lion from appendix II to appendix I. This caused an intense debate between the involved countries in Africa and eventually resulted in the rejection of the proposal. Nevertheless, the states recognized the need for a series of workshops on the conservation of lions in order to arrive at a pan-African agreement. The World Conservation Union was asked to organize these workshops, which would have to bring together all stakeholders in order to jointly develop sub-regional strategies. These strategies would hold a global vision for a future in which the two sub-regions manage their natural resources in a sustainable manner. The aim of the strategy would be to assure the sustainable conservation and management of the lion in West and Central Africa. The strategy is based on Lion Conservation Units, which include potential or known areas for the recovery of lions, which might be considered as important ecological target areas for lion conservation. The presented strategy should be translated in national action plans for a more practical and efficient implementation.

The African Lion: threats status and trends

Hans Bauer
Institute of Environmental Sciences, Leiden University, the Netherlands

In 2005, IUCN and WCS organized a Range Wide Priority Setting exercise for the lion in two workshops, which were reported in two lion strategy documents. This paper presents a synthesis of those data, showing a large recent reduction in lion range, with currently between 23.000 and 40.000 lions left of which only 10% in West and Central Africa. There are 85 Lion Conservation Units (LCU); major threats and characteristics for these LCU's

are summarized. Most LCU's (52 cases, 73%) have more than half their area under some form of legal protection. Seventeen LCU's are very large areas greater than 50,000 km^2 and can be considered strongholds for lions. Indiscriminate killing came out as the most serious threat and presumably most of this killing is retaliatory or pre-emptive killing by pastoralists. Prey depletion is almost equally threatening, followed by small population size and its inherent extinction risks.

Results of a study on lion-livestock conflicts in the Waza Logone area, North Cameroon

Hans de Iongh[1], Hans Bauer[1] and Peter Hamling[2]
1) Institute of Environmental Sciences, Leiden, the Netherlands
2) FASTNET, Scotland, UK

The African Lion Working Group (ALWG) has concluded that there is a lack of research data on lion populations in Central and West Africa. The present research intends to contribute to a better knowledge of lion populations in this region with special reference to lion-livestock conflicts. Research on the lion population of Waza National Park (1700 sq. km) in North Cameroon was initiated in 1995 focusing on livestock depredation, pride structure and movements and home ranges. The main focus of research was on lions in the woodland zone of the Park and on lion-livestock conflicts south of the Park. Research methodology included the use of VHF radio telemetry, the use of calling stations, measurement of lion tracks, direct field observations and regular reports by tourists and guides. Our research indicates very large wet season home ranges of pride members and seasonal movements of individual lions outside the park during the wet season. We also identified the presence of male problem animals. Population estimates range between 30-60 animals in the Park and bufferzone. Prey populations and lion population size have steadily declined since a census in 1962. Wild prey biomass per kg of predator is lowest, when compared with national parks in East and South Africa. In addition lion density in Waza is low (2 animal per 100 km^2), much lower than in East and South Africa National Parks. Tourists rate lions in Waza N.P. among the top two attractions, but tourist numbers have declined during the past decade and the economic cost benefit ratio of lions is negative. Main threats to the lion population in Waza N.P. are a) habitat fragmentation and isolation b) lion livestock conflicts and retaliatory killing and c) poaching. An analysis is made of lion-livestock conflicts in and around Waza N.P. Livestock losses range between 2.1% (cattle) and 20% (goats) of total stock per annum. Three factors are found to be important in relation to the intensity of livestock raiding in villages by lions; a) distance of the village to the boundary of Waza N.P., b) seasonal influence with more crop raiding during the wet season and c) the number of livestock owners in a village. Recommendations for enhancing lion conservation in and around Waza N.P. include a) research focus on the floodplain lions

b) balanced implementation of the management plan and including local benefits and c) compensation for livestock killing.

WWF programme on large carnivores in the northern savannah region of Cameroon
Gilles Etoga
WWF, Cameroon

Current activities implemented by WWF in the Northern Province are focused on the Bénoué National Park (BNP) which covers 800 000 ha (including 8 hunting zones). WWF has aided towards the design of a coherent management plan for the conservation of the BNP, which has become the blueprint adopted by the Cameroon services in charge of environment protection. The WWF Large Carnivore programme for the northern savannah region mainly focuses on African wild dog *Lycaon pictus*. Activities related to carnivore conservation have started in the 90's with the GEF program. The most important study on the topic was performed by Breuer 2001: "*Distribution and feeding ecology of the African wild dog and other large carnivores in northern Cameroon"*. The study took place in and around the Faro NP. Important results were obtained from the study of which the most important are; 1) the number of remaining wild dogs ranges between 50 and 100; 2) interviews and literature reviews show that habitat loss, loss of prey and direct persecution by Mbororo herdsmen have been the major causes for wild dogs' decline, and these threats still exist today; 3) faecal analysis for wild dogs, lions and spotted hyenas revealed, respectively 7, 14, and 16 prey species; and 4) no prey item of domestic animal was found in the faeces, only wildlife. The highest priority for wild dog conservation in northern Cameroon is to maintain contiguity of wildlife areas, and to limit direct persecution. Radio telemetry studies are highly recommended to increase knowledge of wild dogs' behavioural ecology. Since the start of this study, only monitoring activities on wildlife were undergoing in the field. The WWF NSP project has elaborated a new proposal focused on wild dog for the up coming months. The new proposal is in reference to a broader WWF-Cameroon Country Programme Office initiative on the rehabilitation and the conservation of the African Wild Dog through research, monitoring, communication and conservation actions. It will provide the scientific data needed to establish a long-term conservation strategy for a geographically significant and genetically important population of wild dogs in northern Cameroon. This strategy will be elaborated and implemented through conservation actions and communication.

20 years of hunting large carnivores in Cameroon
Jean Paul Kwabong
Ecole de Faune, Garoua, Cameroon

Ideally, hunting quotas should be based on decent scientific data. However, particularly for large carnivores in Cameroon this has not always been the case. Over the past few decades, large carnivores in Cameroon have increasingly become exposed to a variety of threats. Especially for these populations it is therefore crucial to look at management practices in other regions where carnivores are used in a sustainable way for game hunting practices. Results on 20 years of hunting quotas on each species hunted in Northern Cameroon show that 327 carnivores were subject to average and intense hunting practices, representing 3 percent of the total off take of game in this region. As is evident from other regions in Africa, hunting large carnivores could potentially yield substantial revenues for parks and people living around these parks. Since hunting large carnivores becomes increasingly important in Cameroon, more research into this subject is urgently required. The development of a large carnivore hunting management plan, which has been approved by the Chef of Wildlife Service of the Northern Province, is a first step into the sustainable harvest of carnivores in Cameroon.

Carnivore conflicts and solutions in East Africa: the case of Kenya
Seamus Maclennan
Laikipia Predator Project, Kenya

Most conflict between people and large carnivores in Africa is due to depredation on livestock, although man-eating does still occur in some areas. In both Laikipia and Kajiado Districts of Kenya, we have found that properly applied age-old livestock husbandry techniques significantly reduce livestock depredation. These include keeping livestock in sturdy bomas (cattle enclosures) with solid gates and impenetrable thorn bush walls at night; deployment of guard-dogs both at night and while herding during the day to warn of carnivores' presence; and vigilant herding of the livestock during the day to ensure that none stray. We have built over 100 "demonstration bomas" in communal areas, and many people have adopted the modest changes recommended to better protect their livestock. In Kajiado, many livestock are lost to predators when they are left outside of bomas overnight. Improving poor herding practices would dramatically reduce conflict between livestock farmers and large carnivores at little cost. Experiments involving the deployment of capable and suitably motivated herders are due to be carried out in the first quarter of 2007. In both of the study sites, there are intractable difficulties in effecting carnivore conservation because of the minimal wildlife-related economic benefits in Kenya for its citizens. Poison is so readily available in Kenya today that people must realize and perceive economic benefits from carnivores if they are to have the motivation to improve husbandry rather than simply getting rid of large predators. Our work in Kenya shows that any other solutions are either temporary, or palliative, or both.

Livestock-carnivore conflicts: results of an inventory around Bénoué National Park, Cameroon

Barbara Croes & Ralph Buij
Institute of Environmental Sciences, Leiden University, Holland/CEDC, Cameroon

The proximity of lion home ranges to populated areas along the borders of the Bénoué National Park (BNP), illustrated recently by GPS data of two of four GPS_GSM collared lions, suggests that occasional livestock predation by lions is likely. To investigate the status of the carnivore-livestock problem around BNP, structural interviews were conducted of 109 family heads in 19 villages along the western border of the park. These revealed that livestock depredation is a relatively unimportant cause of livestock loss, especially compared to disease. Carnivores were generally perceived as relatively low-nuisance wildlife when compared to olive baboon, patas monkey and elephant. Most carnivore attacks on livestock took place during the wet season, mainly by smaller carnivores, particularly "wild cats", and to a lesser extent by spotted hyena. The wildcat group probably includes genuine African wildcats and African civet, but is dominated by feral housecats. These small carnivores most frequently target chickens. Spotted hyenas cause significantly less financial damage than wild cats through predation of goats, sheep and chickens usually by entering enclosures; however, hyenas were found equally problematic as wild cats. Larger carnivores, such as lion and leopard, rarely take cattle and small ruminants, mostly during the dry season when livestock grazes away from villages without protection. Despite the small scale of the carnivore-livestock problem, poaching and poisoning to deliberately kill carnivores were mentioned on several occasions. A perceived decrease of lion, leopard, wild dog and spotted hyena in the area over the past decade is a likely result of such practices.

The status of Wild dog Lycaon pictus in the Pendjari Biosphere Reserve, Benin

Tehou Comlan Aristide
DPNP/CENAGREF, Benin

The wild dog is threatened throughout the world, but particularly in West Africa the species is on the verge of extinction. Until the late seventies, wild dogs were still regularly observed in the protected ecosystems of the W, Arly, Pendjari, Oti-Mandori and Kéran (WAPOK) and even in some of Nigeria's protected areas. In Benin, several observations have been recorded between the Soudano-Guinean zone and the Suodano-Sahelian zone (between the forest blocks of Mt. Koufé and the two national parks). Over the past few decades, however, the species has become rare and is now absent in certain parts of the country. Fortunately, since 2000 the species started to recover in the Biosphère Transfrontalière of West Benin (RTW-Bénin) and in the Pendjari Nature Reserve in North Benin, which is largely the result of a recent change in the management strategies of the protected areas, implemented by the Benin government, within the framework of the National Centre of Wildlife Reserves (CENAGREF). Observation frequencies of wild dogs

in the Pendjari Nature Reserve recently increased as was observed in the following studies: *Sinin et al.*2001. Decline of wildlife numbers in the RBP; *Tehou* 2002, 2003, 2004, 2005, 2006. Direct observations between 2002 and 2006 were allowed due to the implementation of a new data collection method by the Ecological Service of the park. The numbers of individuals observed in one group varied between 2 and 5.

Setting Priorities for Lycaon conservation in West and central Africa using lessons from Zimbabwe

Gregory Rasmussen
Wildlife Conservation Research Unit, Zimbabwe

Colonialism in Africa caused the Lycaon to suffer from the same (European) negative perception as was the case for the wolf in Europe. Consequently, lycaon was declared vermin in many countries and the resulted persecution of Lycaon was not only restricted to ranch lands but also occurred inside National Parks. In a number of regions of Africa, however, local perceptions of Lycaon as a top predator differed radically from those of Europeans for they were regarded as an asset. In Zimbabwe, Shona people consider the dogs as useful, for painted hunting dog kills provided a source of meat that could easily be scavenged. In a similar vein in the Guruve District north-west Zimbabwe the dogs are considered spiritual protectors which assist in providing meat during drought years. However, the Matabele people in Zimbabwe deliberately snare the dogs, which is carried out for traditional medicine and not out of malice; their objective being to obtain teeth in the hope of psychogenically acquiring the hunting prowess of the dogs.

In Zimbabwe, research on Lycaon commenced in 1989 focussing on data based on mortality, public perception, prey analysis, range utilisation, and as the species can be regarded as eusocial, the impact of pack size and social benefits.

A complex social structure provides competitive advantages for the dogs although it makes them vulnerable to extirpation where disturbance is focussed on the group level. Data on range use and drifting territoriality revealed that dog ranges are large, distances walked enormous, thereby highlighting the limited role that could potentially be played by (relatively small) protected areas. A subsequent need for human tolerance and focus on areas outside protected areas became evident. These research outcomes resulted in the development of management tools as well as conservation strategies specifically containing 5 components: Continued research, direct conservation of the dogs, conservation education, capacity building for the future and community development.

17 years of research effort eventually resulted in a doubling of the species range and numbers in Zimbabwe. Furthermore, people's perceptions changed which resulted in a protected status for the species. Finally, rural communities have been able to interact positively with the species through education, capacity building and employment

Current knowledge on the species in West and Central Africa is poor and information on whether this region still serves as a valuable reservoir for this endangered species is lacking. Limited data highlights, however, that populations do exist in West and Central

Africa (Central African Republic, Niger, Cameroon, Senegal and Benin) though existence of the species in other countries still needs confirmation. To arrive at an inventory of the status of Lycaon in West and Central Africa, a regional initiative will be implemented.

Lion research in Benin: assets and prospects
Etotepe A. Sogbohossou
Agricultural Engineer/Research Assistant, University of Abomey-Calavi, Benin

In contrast to other parts of the world, especially Africa, wildlife is relatively understudied in West Africa, and in Benin in particular. One of the species in the region not having received much research attention is lion. Since 2001, after the first workshop on West and Central African lion in Limbe, lions started to become the focus of wildlife research in Benin. Different aspects have been studied so far: the status and the demography of lions' populations in protected areas, human-carnivore conflicts and the socio-economical importance of large carnivores. These different studies show that lion densities in Benin are relatively low. Despite these low numbers, however, lions often leave protected areas to exert depredation on livestock. This behaviour has led to a negative perception by local populations on lion conservation and wildlife conservation in general. Another threat is the use of lion parts in traditional medicine; lions are among the most frequently used species for this purpose. Due to limited funds, studies focusing on lion conservation are conducted at a limited scale and some aspects like the long-term demography, ethology and ecology of Benin lions are still to be investigated. The new Regionally Endangered status of lions in West Africa increases this need to enhance our understanding of lion ecology, distribution and behaviour in Benin and West Africa.

Conflicts between large carnivores and domestic livestock in the peripheral zone of the Regional Park "W" in Niger
Hamissou H. Malam Garba, Ilaria di Silvestre
Directorate of Wildlife, Fisheries Niger

This study contributes to the conservation of large carnivore populations of the Regional Park "W" (PRW) and its periphery by analysing the causes of conflicts between carnivores and the rural communities. To arrive at these results, we have evaluated the depredation of domestic livestock by large carnivores in the peripheral zone of the PRW, and we have estimated its economic impact. Methods used consisted of interviews in a sample of 32 villages of the 87 villages present in the study area, preselected according to criteria related to the presence of predation. 154 people were interviewed, chosen among those whose livestock were attacked by carnivores. The results show that there is a definite predation problem caused by wild carnivores. The principal predators are, in order of importance, the species duo caracal and jackal (often impossible to distinguish which caused attacks), spotted hyena and lion. Cheetah, leopard, and wild dog only predate on livestock

occasionally. During the course of this study, between 2000 and 2006, 3271 livestock of different species were attacked by wild carnivores. This equals an average number of 468 livestock per year, or three (3) heads of livestock per person per year. The majority of attacks (593 cases during the 7 months) were caused by caracal or jackal (267 attacks), followed by spotted hyena (193 attacks) and lion (125 attacks). In contrast, the depredation caused by leopard (3 attacks), cheetah (2 attacks) and wild dog (2 attacks) are very rare. Among the species attacked most frequently, are the small ruminants (sheep and goats), followed by cattle and donkeys. The attacks occur mostly at night at grazing sites and during the rainy season. The economic losses for all people interviewed between 2000 and 2006 are estimated at approximately FCFA 82,242,014 or USD 149,530. This loss equals an annual average of FCFA 76,291 or USD 138 per year per person. 81.53% of people had a negative attitude towards predators. 14.28% confirm that they would kill predators, while 30.51% of interviewed indicate they have no means to stop attacks. Only 6% of interviewed actively defend their livestock from wild carnivores. An information and training programme of rural populations on the prevention of carnivore attacks and on the value of carnivores in the environment is necessary to prevent an increase of problems the coming years.

Conservation and management of lions in southern Africa: status, threats, utilization and the restoration option

P.J. Funston
Department of Nature Conservation, Tshwane University of Technology, South Africa

The declines in lion numbers and distribution recorded throughout its range are typical also of the situation in southern Africa, with the largest reduction having occurred in South Africa. There are also fundamental differences in South Africa, as compared with other countries in the sub-region, with lions being restricted to fenced reserves. However, the presence of these fences, along with a substantial increase in wildlife related tourism in the country, has resulted in 25 new populations having been established in the last 15 years. Collectively these reserves cover an area of 5702 km² incorporating about 460 lions. The management of lions in these small fenced reserves is complicated primarily by the small size of each subpopulation, and the predation impact on the ungulate populations in each reserve. This has lead to the development of micro-management strategies that are questionable in terms of their desirability, effectiveness, and financial sustainability. These restored populations nevertheless offer the potential for meta-population management and meaningful conservation benefit. However, as most of these populations are not managed according to meta-population guidelines, tending rather to be managed as single populations, it remains doubtful that they individually can make a meaningful contribution to lion conservation. While lion populations in other southern African countries suffer from the negative effects of habitat and prey loss, as well as excessive human conflict related mortality, there is evidence from large conservancies being established in several countries, that lion populations are being restored in areas where they were extirpated. Some countries

in southern Africa clearly also set lion hunting quotas that are not biologically sustainable, and threaten at least four of the seven important populations in the region. There are, however, initiatives underway to bring these levels of utilization in line with guidelines that will ensure a sustainable harvest.

Status, trends and threats for lion populations in the Republic of Guinée
Aboubacar, OULARE
National Centre for Protected Area Management / Ministry of Environment

Recently, the attention was drawn to the lions of the Guinea as a result of a sudden awareness that lion population numbers are decreasing and habitat is destructed. Although the national legislation classifies the lion as a protected species, the lion is still facing a variety of threats. The large carnivores of Guinée (lion, leopard, wild dog, spotted hyena) are all confined to a marginal region, which can be divided into four main sectors (east, central, north and north-west). Within these sectors, human population density is estimated at approximately 5 inhabitants per km2. Calling stations appeared to be ineffective for the purpose of counting large carnivores, since not a single individual responded to a calling station, for unknown reasons. However, the authors are convinced of their existence. The tendency of lion populations to decrease is in accordance with a reduction in habitat of approximately 50-60%. The reduction in lion numbers is thus primarily related to a reduction of habitat but also caused by a decrease in prey numbers and the occurrence of conflicts between people and lions. The implementation of the micro-project Rocal allowed for the first actions towards lion conservation in the country. The innovative character of the activities described in the ROCAL plan created possibilities and initiated i) awareness amongst human populations in and around the National Park by using statements of the Holy Koran; ii) the implementation of an operation trying to limit problems associated with lions moving outside park boundaries in cooperation with hunters from villages; iii) an awareness amongst assemblages of village hunters in particular to become responsible for especially the habitats they inhabit; and (iii) to educate and inform villagers of the need and importance of carnivore conservation in the region.

Human-lion conflicts, ecology and status of lion in the Zakouma National Park, Tchad
Ministry of Environment and Fishery, N'Djaména, Tchad

There are only few data on lions in Central Africa. The Zakouma National Park (ZNP; surface area: 300 000 ha) is situated in the south east of Tchad. The objective of the present study is to contribute to the conservation of large felids in Central Africa, and to acquire a better understanding of lion populations and their survival chances in ZNP. The specific targets were to estimate lion abundance and movements, their relationship with prey densities, and to assess the status of human-lion conflicts. Methods included lion counts based on individual recognition, in addition to observations from game guards, tourists and

local communities, and nocturnal call-in surveys at waterpoints. The spatial distribution of lions was investigated with radio-tracking. We estimated prey abundance based on aerial counts, and human-lion conflicts through interviews with local communities. The results obtained between 2003 and 2006 are presented.

ANNEX I. PROGRAMME LARGE CARNIVORE SEMINAR 2006

	Time	Subject	Speaker
15 November	9.00-9-30	Opening speech Official presentation of regional lion conservation strategy	Governor of North Province Cameroon Hans de Iongh (CML) Adam Saleh (ROCAL/Ministry of Environment, Cameroon)
	Session 1	Chair: Jean Pierre Mvondo Awono	
	9.30-10.00	West and Central African Lion Conservation Strategy	Adam Saleh (ROCAL/Ministry of Environment, Cameroon)
	10.00-10.30	Coffee break / press conference about strategy	
	10.30-11.00	The African Lion: status, trends and threats	Hans Bauer (CML)
	11.00-11.30	15 years of lion research in northern Cameroon	Hans de Iongh (CML
	11.30-12.00	WWF program on large carnivores in the Benoue area, Cameroon	Gilles Etoga (WWF)
	12.00-12.30	Carnivore safari hunting in Cameroon over the last 20 years	Jean Paul Kwabong (EFG)
	12.30-13.30	Lunch	
	Session 2	Chair: Hans H. de Iongh	
	13.30-14.15	Carnivore conflicts and solutions in East Africa	Seamus Maclennan (Lion Project Amboseli ecosystem)
	14.15-15.00	Lion ranging and large carnivore-human conflicts in the Benoue ecosystem (Cameroon)	Barbara Croes (CEDC/CML)
	15.00-15.45	Status of Wild Dog in West Africa, particularly Pendjari NP (Benin)	Aristide Tehou (Ministry of Environment, Benin)
	15.45-16.15	Coffee break	
	16.15-17.00	Feasibility and the way forward for Lycaon research and conservation in West Africa	Gregory Rasmussen (Painted Dog Foundation)
	17.00-17.45	Benin Lion Research Project	Etotepe Sogbohossou (University of Abomey, Benin)

16 November	**Session 1**	Chair: Ralph Buij	
	8.30-9.15	Lion livestock conflict in Niger	Hamissou Garba (Ministry of Environment, Niger)
	9.15-10.00	Management of lion populations in southern Africa	Paul Funston (Tshwane university, Pretoria)
	10.00-10.30	Coffee break	
	10.30-11.15	Rocal microproject 1: Status, trends and threats of lions in Guinea	Aboubacar Oulare (Ministry of Environment, Guinee Conakry)
	11.15-12.00	Rocal microproject 2: mitigation of depredation around Pendjari NP (Benin)	Aristide Tehou (Ministry of Environment, Benin)
	12.00-13.00	Lunch	
	Session 2	Chair: Theodore Mayaka Bileng	
	13.00-13.45	Rocal microprojet 3: lion survey in and around Zakouma NP (Tchad)	Director of Wildlife (Ministry of Environment, Tchad)
	13.45-14.30	Rocal microproject 4 : livestock corridor to reduce lion damage in Benoue NP (Cameroon)	Assan Gomse (EFG)
	14.30-15.00	Coffee break	
	15.00-15.45	Rocal microproject 5: lion damage mitigation around Waza NP (Cameroon)	Adam Saleh (Ministry of Environment, Cameroon)
	15.45-16.30	An update on large carnivore populations in Tchad	Director of Wildlife (Ministry of Environment, Tchad)
	16.30-17.15	Wrap-up discussion	All

ANNEX II. LARGE CARNIVORE TRAINING COURSE 2006 EFG GAROUA, CAMEROON

Time	**Friday 17 November**	**Speaker**
10.30-11.00	Brief opening speech and introduction of speakers	Jean Paul Kwabong (EFG, Garoua)
11.00-11.30	Rocal lion conservation strategies	Adam Saleh (S.G. ROCAL,Game Warden Waza N.P.)
11.30-12.15	The African lion: status, trends and threats	Hans Bauer (CML)
12.15-12.45	Conservation of lion populations in southern Africa	Paul Funston (Tshwane University, Pretoria)
12.45-13.15	**Lunch Break**	
13.15-14.00	Wild dog conservation in Africa	Gregory Rasmussen (Painted Dog Foundation)
14.00-14.30	Large carnivore conservation in Benin	Aristide Tehou (Ministry of Environment, Benin)
14.30-15.00	Benin lion research project	Etotepe Sogbohossou (Abomney university, Benin)
15.00-15.30	**Break**	
15.30-16.15	Lion conservation and lion livestock conflicts in Cameroon	Hans de Iongh (CML)
16.15-16.45	Cameroon large carnivore research project	Barbara Croes (CEDC/CML)
16.45-17.45	Discussion	
Time	**Saturday 18 November**	
8.00-8.30	Lion conservation in Guinea	Oulare Aboubacar (Ministry of Environment, Guinee Conakry)
8.30-9.00	Managing lion livestock conflict in Niger	*Hamissou Garba*
9.00-9.45	Carnivore conflicts and solutions in East Africa	Seamus Maclennan (Lion project Amboseli Ecosystem)
9.45-10.45	Discussion	