

3. LION CONSERVATION POLICIES

- **International status**

The African lion is categorised as vulnerable by IUCN in the Red List of Threatened Species of the World (IUCN SSC, 2000).

The lion is currently listed in appendix II of CITES. This allows for continued international trade in the species under the export permit system.

- **Continental status**

This study does not find evidence that the African lion, as a species, is threatened with extinction.

However, the conservation status of the taxon appears clearly very uneven throughout its range. The different situations faced by each respective sub-population demonstrate different levels of threat. By breaking down the taxon into sub-populations, it appears that the different sub-populations may be classified in all the various categories of conservation status: some sub-populations are extinct, some are extinct in the wild, some are critically endangered, some are endangered, some are vulnerable, some are near threatened, some are of least concern, some have deficient data and some are not evaluated.

As a consequence, while a continental overview is no doubt useful, a more in-depth approach is definitely needed to design a sound action plan for the long-term conservation of the lion. Such an action plan is now urgently required to:

- (i) Determine conservation priorities;
- (ii) Define appropriate strategies on a continental, regional, national and sub-population basis, and;
- (iii) Design effective ways to implement these strategies.

- **Regional and National status**

The level of protection given to lions differs between Range States from strict protection to very little protection at all. National legislation determines whether the lion may be hunted for sport, be the object of PAC, or not at all. Most Range States allow the control of problem animals. Traditional lion hunting is generally prohibited nowadays even though it is still often practised. Some examples of the conservation status are given below in a limited number of Range States.

- *Western Africa*

In Burkina Faso, by far the main “lion country” of the region, the taxon is managed by the *Direction de la Faune et des Chasses* (Direction of Wildlife and Hunting) under the authority of the *Ministère de l’Environnement et de l’Eau* (Ministry of Environment and Water).

In Senegal, the *Direction des Parcs Nationaux* (Direction of National Parks) is responsible for the management of the lion. Two special licences for hunting lion may be issued annually by the President of the Republic.

- *Central Africa*

In Central African Republic, maybe the main “lion country” of the region, wildlife in general and lion in particular, fall under the responsibility of the *Ministère des Eaux, Forêts, Chasses, Pêches, Tourisme et Environnement* (Ministry of Water, Forestry, Hunting, Fishing, Tourism and Environment).

In Chad, the lion is managed by the *Direction de la Protection de la Faune et des Parcs Nationaux* (Direction of Wildlife Protection and National Parks) under the auspices of the *Ministère de l'Environnement et de l'Eau* (Ministry of Environment and Water). In this country, the powerful *Ministère de l'Elevage* (Ministry of Livestock) has a say in the problem of cattle depredation by lions and other predators.

- *Eastern Africa*

In Tanzania, lion management falls under the general management plans for the respective habitats (Selous, Serengeti etc.) and hence under the respective responsible authorities:

- The Tanzania National Parks Authority (TANAPA), a para-statal organisation for National Parks;
- The Wildlife Division (WD), a Government department of the Ministry of Natural Resources and Tourism (MNRT) for all game outside National Parks and Ngorongoro Crater, and;
- Ngorongoro Crater Area Authority (NCAA) for the Ngorongoro Crater.

There are no specific monitoring programmes of lion populations/habitat apart from the registered research programmes discussed below. Lion monitoring falls under the general monitoring activities of the respective authorities. The hunting offtake is monitored by the respective area (Game Reserve or District) by controlling the hunting licenses issued by the Wildlife Division, accompanying the hunting parties and checking the trophies taken out of the hunting area against the licenses. The appropriate institution, depending on the CITES-status of the animal, then issues certificates of ownership. Several lion research programmes are active in Tanzania, e.g.:

- “Project Life Lion”, Serengeti NP (Sarah Cleveland, Principal Researcher);
- “Serengeti Lion Project”, Ngorongoro Crater, Lake Manyara NP, Serengeti NP (Craig Packer, Principal Researcher);
- “Maswa Game Reserve Lion Project” (Karyl Witman, Principal Researcher);
- “Tarangire Lion Monitoring Programme” (Fondo per la Terra, Malcolm Ryen), and;
- Selous Game Reserve (Nancy M. Creel, Scott Creel, Goran Spong).

The general approach is to manage habitats to ensure that wildlife populations and wild areas are retained. In this way, free ranging lion populations will continue to survive. Use of drugs and other direct physical control methods are not favoured (L. Seige & R. Baldus, pers. comm.).

In Sudan, hunting licences are reported as being issued by the Government in the North, but are apparently not recognised in rebel controlled areas in the South, who are issuing their own licences. It is not known if or how many licences are issued for lion. There are recent moves to improve conservation in Southern Sudan, preliminary surveys being underway in Boma National Park, and others are planned.

In Uganda, there is no hunting of lion. The Government recently reintroduced the licensing of the trade in animal products, and it remains to be seen whether this will involve trade in lion products.

In Kenya, the lion is classified as fully protected, but is subject to PAC.

- *Southern Africa*

In Zambia, in 2001, a Presidential Order banned all safari hunting for one year while the new Zambia Wildlife Authority (ZAWA) was being set up. Safari hunting is now partly reopened and will probably be fully so in May 2003, once the safari hunting concessions have been allocated.

In Namibia, the lion is a protected species under Ordinance 4 of 1975. Trophy hunting is authorised and regulated by permit. Lions may be shot in protection of livestock but any such incident has to be reported to the authorities within ten days. There is no specific national lion management plan in the country, although research and monitoring activities have been launched in the mid-1990's (Predator Research Program) and are currently directed at developing such a plan in 2002/3. A Namibia Large Carnivore Atlas has been produced in 2001. Detailed population ecology and demography studies are being conducted in Etosha, Kunene and the Kaudom sub-populations. Community-based conservation programmes are currently in place in all three areas to monitor and promote suitable habitat for lions (Stander, 1990).

In Malawi, all lions are protected. No form of hunting is permitted. There is only sparse information available on lion utilisation, hunting or even Problem Animal Control in Malawi. In this country, all lion conservation, management and monitoring is carried out by the State conservation agency (DNPW) as an integral part of its management of all Protected Areas. There is no specific official programme to manage or monitor lions and no available reports on their status and trend within Malawi. What monitoring of lion activity does take place is ad hoc/circumstantial by visitors and local staff. Problem animals are closely monitored but most end up being shot.

In Zimbabwe, the hunting, capture and translocation of lions is permitted under permits issued by the relevant Minister - Parks & Wildlife Act, Chapter 20:14, Revised edition 1996. Notwithstanding this, the killing of lions in defence of human life is permitted without possession of a permit. Landowners are permitted to kill lions that are a threat to domestic livestock. There is no specific national management plan for lion. Generally, there is no formal monitoring of lion population numbers or lion habitats. However, monitoring is a by-product of some short to medium term research projects on predators. Sport hunting quotas are set annually by area. Sport hunting quotas are set by, or subject to approval by the Department of National Parks & Wildlife Management (DNPWM). Some data is collected for exported lion trophies (NP9 forms). If the DNPWM records offtakes for reasons other than sport hunting, it appears that these data are not readily available. More information is needed

on all offtake of lions (trophy hunting in all land categories, problem animal control and poaching), as well as the annual trends in these data (V. Booth, pers. comm.).

In Botswana, a National Predator Management Strategy is in the process of being developed by the Department of Wildlife and National Parks (DWNP). There is limited monitoring in the Northern regions and little protection in the Central regions. Policies in place in the Southern Kalahari/Kgalagadi region are primarily for the management of stock-raiding lions. In Botswana, trophy hunting of lions is restricted to quota per Wildlife Management Area. A temporary national ban on problem animal control and zero quota for trophy hunting of lions was instituted in January 2001. The Northern regions had a hunting quota until 2000. In the Southern Kalahari, a zero quota in Wildlife Management Areas surrounding the Kgalagadi National Park has been imposed for about 8 years prior to the nationally imposed zero quota. Lion surveys, utilizing calling stations, have been conducted by the DWNP in collaboration with private researchers to establish population estimates and structure in Northern Botswana. The proposed management strategy includes surveys every three years using calling stations in high-density areas and spoor surveys in low-density areas. The wildlife off-take policy in Botswana is one of sustainable use as long as it does not influence the conservation status of those species utilised in conservation zones. Lethal PAC is normally allowed but a temporary national ban on lethal problem animal control was established in November 2000. The proposed strategy for healthy sub-populations is one of sustainable quotas and allowance of lethal problem animal control. However, in areas adjacent to locally threatened populations, lethal off-take would be prohibited and conflict resolution measures put in place. Between 1995 and 2000, in the Okavango Delta, localised surveys were conducted and comprehensive surveys occurred in 1998 and 1999. Comprehensive surveys were also conducted in the Kwando/Chobe river area in 1999 and 2000. The Dry North had a low sampling intensity in 1999 (the calling station technique is not suitable for low-density populations). The Southern Kalahari/Kgalagadi region has very little sustained monitoring: population surveys have been conducted in 1976 and again in 1998-2001. The surveys show little change in the population size/structure. As a result, the population is not, nor does it maybe need to be, actively managed. The current ban on killing lions resulted probably from an excessive destruction of lions by livestock owners and farmers. Several poisoning incidents occurred, killing lion, hyenas, jackals and vultures. The proposed predator management strategy is based on the current mainstream thinking regarding predator conservation and conflict resolution. The management measures taken in the Northern areas are probably sufficient, although habitat destruction and increasing human population are of concern. The management measures taken in the central areas are considered to be insufficient. In the Central region, the main management issues are an increasing human population and reduced migratory ungulate population. The vast migratory wildebeest populations of Central and Southern Botswana were interrupted in the 1980's due to expansion of the cattle farming industry and the erection of game control fences. Springbok populations are now showing similar declines in this country and are not receiving much conservation attention. The collective effect of this will be (i) decline in lion, and other large predator populations, especially outside Protected Areas, and (ii) increase in lion/livestock conflicts. There is little understanding of the impact of PAC mortality, or the effect of high human densities and livestock populations in designated conservation areas (Wildlife Management Areas). In the Southern Kalahari/Kgalagadi region, current management measures manage situations in an *ad hoc* or crisis manner. In the Northern and Central regions, PAC officers are insufficiently trained and equipped. There is limited extension training. Management recommendations from a detailed study (Funston, 2001) have been made for the Southern Kalahari/Kgalagadi region. Community extension programs and the capacity to deal with stock raiding lions are seen as imperative, but remain

insufficient. Improving capacity and working more closely with communities, especially in Botswana, have been identified as crucial in terms of long-term lion conservation (P. Funston & C. Winterbach, pers. comm.).

In South Africa, hunting of lion is allowed in some parts of the country. This is controlled and regulated by the nature conservation authorities in the various Provinces. Generally hunting is restricted to private and provincial Game Reserves. Hunting of lion is forbidden in Kruger National Park (KNP), Kgalagadi Transfrontier Park, Hluhluwe-Umfolozi Game Reserve (HUGR), Phinda, Kwandwe and Shamwari. Hunting is restricted in Madikwe and Pilanesberg. In Mpumalanga Parks (MP), hunting of lion is legal provided that the size of the reserve is larger than 2000 ha and lions are wild (i.e. not captive-bred or hand-reared). KNP has no specific lion management programme in place. KNP believes that their current management policies are appropriate, but that sub-populations in the park itself and surrounding areas should be monitored more closely. Closure of artificial water points may lead to a slight (10%) reduction in the over-inflated lion population. Disease monitoring and research are currently conducted to evaluate the threat of bovine tuberculosis. MP believe that Kruger lions are a non-reliable source for reintroduction due to disease and would like to see more reintroductions from disease-free areas. HUGR, Kwandwe and Shamwari have been the recipients of individuals from the Pilanesberg/Madikwe metapopulation. The motive behind the recent introductions of 4 and 6 females from Pilanesberg/Madikwe into HUGR and to other reserves in Zimbabwe has been to minimise the disturbance to pride dynamics. Introduced females and resident females are captured and kept in a boma together to bond and encourage pride integration and reduce escapes from the reserve. Kwandwe and Shamwari have not yet reached the stage where they need to consider off-take of lions: the reserves' carrying capacities are estimated to be approximately 15 lions based on similar-sized reserves with comparable prey density. Introductions have been conservative because of the fear of possible impact on cheetah. Kwandwe and Shamwari monitor what prey species are being focused on through scat analysis studies. They are also monitoring the lion's home range development. At Kwandwe, lions are routinely inoculated against rabies as a precautionary measure because of surrounding domestic stock. HUGR's *ad hoc* reintroduction programme is to enlarge the gene pool of lions in the HU complex. Lions are collared and monitoring takes place both through tracking and regular call-ups. North West Parks believe their management measures to be appropriate as lion populations are increasing, disease-free and bringing in revenue. The recent introductions into HUGR have had a moderate success rate and the females do settle down: they have not broken out of the Reserve (G. Kamasho *et al.*, pers. comm.).

4. CHALLENGES

4.1. CONTROVERSY AND PARADOX

- **Divergent perceptions of lion conservation**

Historically, lions have captured our imagination to the point that, in some societies, especially in the North, they have become cultural icons and have been incorporated into literature and language. As a result, their conservation is often a highly emotive issue. This extra interest in the species can be a force in their favour when it comes to conservation. Certainly, focusing on a single flagship charismatic species can often conserve a whole suite of species and their habitats.

However, for those rural African communities that have to share their lives with lions, the perception of the “*King of Beasts*” is often very different from those who do not live side by side with wildlife. Lions may represent loss of livelihood, threat to life and suffering to rural African communities. The communities therefore often view them in a negative perspective. For instance, a study conducted in and around Queen Elizabeth National Park, Uganda, showed the following results when asked about the best way to deal with stray lions that come into the village (Dricuru, 2000):

- 37% of the respondents (156 questionnaires returned and analysed) advocated the stray lions should be killed;
- 35% said a fence should be erected around the Protected Area, and;
- 28% felt people should be taught how to avoid lions.

- **Adverse impact of lion conservation on rare species**

When lions become over-abundant in comparison to the availability of wild prey species there may be conflict between different conservation goals. In some cases, rare taxa may be threatened due to too high predation by lions. However, this situation may arise in the context of populations and other human induced factors and have possibly more to do with people's perceptions and values than any real ecological rationale. For instance:

Antelopes

- Bongo (*Boocercus euryceros*)

"...the Kenya Wildlife Service has, over several months, culled some (30) lions from the Aberdares National Park which is fenced, [where] the total number of lions is estimated to be between 145 - 180. The principal reason for the culling is their having been the main predators of the rare bongo population as well as inflicting serious depredation on the bushpigs (and giant forest hogs) within this particular habitat..." (Nehemiah Rotich, in litt. anon., 2001a).

- Giant sable (*Hippotragus niger variiani*)

In Angola in the 1940s and 1950s, the lion was regarded as a pest in the *Reserva do Luando*, threatening the giant sable, especially old males. Later, more accurate observations were

considering the lion as quite rare in the region with low impact on the giant sable (Silva, 1972).

- Roan antelope (*Hippotragus equinus*)

In South Africa, predation by lions is considered to be one of the causes of the roan antelope's decline in the Kruger National Park, South Africa (Harrington *et al.*, 1999).

Carnivores

- Wild dog (*Lycaon pictus*)

In Botswana, *"lions are known to be the single largest natural source of mortality of wild dogs, with lion predation resulting in more than 80% of known mortality in this study. Lion distribution and abundance is an important, and probably the most important, population-limiting factor for the wild dog"* (McNutt, 2001).

- Cheetah (*Acinonyx jubatus*)

In Tanzania, the lion factor plays a substantial role in the viability of the cheetah:

. "Of great importance is the heavy toll exacted by lions and hyenas on cheetah cubs; for example, in the Serengeti, cubs have only a 5% chance of survival to independence" (Laurenson, 1994 in Jackson, 1997).

. "At low lion density [in the Serengeti ecosystem], the cheetah population has very low risk of extinction. At average and at high lion density, however, cheetah extinction risk is very high" (Kelly, 2001).

Suids

The giant forest hog (*Hylochoerus meinertzhageni*) appears heavily preyed upon by the lion in Aberdares NP, Kenya.

4.2. INTENSIVE MANAGEMENT ISSUES

• Contraception

In response to some of the problems of managing small populations, particularly in South Africa, there have been a number of attempts to sterilize male lions by vasectomy in order to reduce the number of births to prevent overpopulation. However, these operations have met with mixed results and generally seem to have resulted in more problems than they have resolved. Most of these are as a result of the complex, and seemingly brutal, nature of social hierarchy within lion society.

Apart from the cost implications and the logistical impossibility of carrying out such surgical interventions over vast areas, the population structure of lions is highly dynamic and anything that attempts to freeze this in time is likely to throw up other problems. This technique is

probably most useful for managing small captive populations but is too intensive, costly and intrusive to have any useful field application to wild populations.

- **Captive breeding**

There are more than 1,500 African lions in captivity worldwide, including breeding populations in many wildlife parks. This figure probably registers "official" lions only, overlooking lions kept by individuals. The value of these populations to conservation is dependent on the quality of their management. Certainly in the future the captive management of some small populations may benefit genetically the long-term survival of other small populations and races that have become fragmented in their distribution.

- **Reduction of lion population size and gene pool impoverishment**

When wild populations of a species become small and geographically isolated, there is room for some concerns about the genetic consequences of this isolation (Simberloff, 1988). In lions, dispersal patterns of sub-adult males and the high turnover of breeding males in female prides normally minimise the risk of inbreeding. Habitat fragmentation, human persecution and in some instance epidemics have divided the former range of lion into distinct sub-populations, some of them being almost 'island' populations. In these small isolated populations, the rate of inbreeding can reach a level that may cause a decrease in reproductive performance. This has been observed for the most isolated lion population, the unique Asiatic population in the Gir forest, India, where the males show high levels of developmental sperm abnormalities and diminished testosterone levels (O'Brien *et al.* 1987, Wildt *et al.* 1987). On the other hand, in Africa, male lions get kicked out of their maternal pride and roam around or migrate looking for available females, this mobility ensuring a mixture of genes, even over long distances. For instance, in Etosha NP, where lion densities are estimated between 1 and 3 per 100 km² according to the various authors, the home range of one pride of lions was stated as covering 2,075 km² and overlapping the home range of a number of other prides (Stander 1991).

Long-term studies have been carried out in the Ngorongoro Conservation Area, demonstrating that inbreeding does not have a significant effect on the survival of those populations. However in this area, one of the best studied lion populations shows a low level of heterozygosity compared to that of the Serengeti NP, as well as higher proportion of morphologically abnormal spermatozoa (Packer *et al.*, 1991). However, the low level of heterozygosity may in fact reflect the history of the Ngorongoro population which developed from a restricted set of founders (15 individuals), although its isolation may have amplified its original low genetic variation (Packer *et al.*, 1991). There is certainly an effect on reproductive performance but the long term consequences for the population are difficult to foresee, as there are several examples of large felids that have undergone such genetic impoverishment as a consequence of population fragmentation or population bottlenecks and are still widespread, although not all in a favourable conservation status (e.g. cheetah, puma) (O'Brien *et al.*, 1985, 1990).

Today, the risk of reduced genetic variability, and its consequences for the conservation of lion populations, is still the focus of many researchers particularly because of the development of introduced or re-introduced populations. The number of these 'artificial' populations has increased in the last decade, promoted by the increasing demand of the tourism industry. Small founder populations in public or private game reserves in South

Africa have shown good reproductive rates, but the initial genetic variability is low and hence managers of these small fenced populations are giving much attention to ensuring gene pool diversity through translocation and introduction of new genetic stock from different origins (Hunters and Slotow, 1999).

In small populations residing in unfenced areas, the occasional wandering lion could be enough to promote heterozygosity. In a simulation ‘experiment’ based on lion population dynamics and genetics, it was shown that only few exchanges (once every 5 years) could maintain a reasonable level of heterozygosity (Starfield *et al.*, 1981). The exercise of Population and Habitat Viability Assessment (PHVA) may be of help to provide guidelines in this regard.



*Wildebeest as prey, Masai Mara National Park
(Photo : Ph. Chardonnet).*



*Eland as prey, Kalahari
(Photo : H. Fritz).*



*Cattle-raider, Serengueti National Park
(Photo : H. Planton).*



*Elephant as prey, Namibia
(Photo : B. Chardonnet).*



*Buffalo as prey, Luangwa valley
(Photo : B. Chardonnet).*



Porcupine, Masai Mara (Photo : Ph. Chardonnet).



Buffaloes, Virunga National Park (Photo : Ph. Chardonnet).



Ankole cattle, Akagera National Park (Photo : Ph. Chardonnet).



Roan antelopes, Waza National Park (Photo : H. Planton).

"Alors King s'en alla vers ses femelles qui le réclamaient. D'abord, et comme par politesse envers nous, d'une foulée lente et digne. Mais à mesure qu'il s'éloignait, il allongea le pas. Enfin, il s'élança et rejoignit en quelques bonds lionnes et lionceaux. Ils s'enfoncèrent ensemble dans les fourrés."

Joseph Kessel, 1958. Le Lion

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