

MINISTRY OF NATURAL RESOURCES AND TOURISM

WILDLIFE DIVISION

TANZANIA



**COMMENT ON ESA STATUS REVIEW OF THE AFRICAN
LION, 77 FR 70727, NOVEMBER 27, 2012**

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SECTION I. REMARKS ON ESA STATUS REVIEW OF AFRICAN LION

Tanzania forms an important region for nature conservation, not only because of its biogeographic location, but also due to the economic and socio-political incentives that are directly derived from natural resources such as wildlife. These incentives in turn have ensured the maintenance of abundant, healthy population of wildlife species of global importance such as the african elephant, leopard, cheetah and lion. Through sound ecological management and legislation, many wildlife species flourish in the vast tracts of wildlife habitats set aside for nature conservation. It is because of these efforts that Tanzania hosts today important global populations of wildlife species.

The global population of wild lions stands at approximately 30,000 animals and Tanzania is home to 16,800 (56%) making it an important range state for their conservation (Mésochina et al., 2010; Riggio et al., 2012). Population estimates over the past 10+ years suggest the lion population is stable in Tanzania in spite of ongoing threats facing the rest of the global population, e.g., habitat loss, illegal killings etc. (IUCN, 2006a & b). Therefore, in Tanzania, the lion is regarded as neither threatened nor endangered. It can be argued that while the rest of the global population seems to show a declining trend, the stability in population in Tanzania is due to the continued protection of wilderness areas utilized by lions and other wildlife and the tangible benefits supporting local communities around protected areas derived through consumptive and non-consumptive wildlife resource utilization. We therefore insist that the lion does not qualify to be listed under the U.S. Endangered Species Act (ESA).

A. Background

A.1. Lion biology, range and population trend in Tanzania

The African lion is the largest of Tanzania's large carnivores and one of the most widely spread species. Lions inhabit all the major wilderness habitats in Tanzania where there is stable prey base, water, and minimal human disturbance.

Lions continue to have a wide distribution in Tanzania. Recent survey by Mésochina et al. (2010) found lion's range to be 750,000 km², equivalent to 85% of mainland Tanzania's surface area. The temporal or permanent presence of lions in this area remains unclear, but an estimated 335,000 km² of the area lay within protected areas such as NP and GR which all but 2 NP are documented to have populations of lions (Mésochina et al., 2010). Outside PAs lions continue to survive and their interactions with humans are high (Packer et al., 2005a). Little is known of the past abundance; however historical tribal tales and legends suggest fewer lions survive today than did in the past 50 years.

A recent estimate put the population at approximately 16,800 individuals (Mésochina et al., 2010). Based on continental and national wide surveys, the population appears to have stabilized around an average of 16,000 individuals between 2002 and 2011 (IUCN, 2006a & b; Ikanda and Packer, 2006; Mésochina et al., 2010; Riggio et al., 2012). Prior to this period, no systematic studies had ever been undertaken to estimate the lion populations' abundance.

Lions are protected throughout the country, and it is the policy of the Government to conserve them both inside and outside of the protected areas as part of the country biological heritage (Wildlife

Conservation Act, 2009). There is no particular attempt to manage lions as a species, as this is deemed not possible scientifically, given the important number of lions and extensive networks of PAs (that are unfenced). Instead lions in all National Parks and Game Reserves and in the future also the GCAs, OA/WMA are managed as part of ecological systems on the basis of General Management Plans (GMP) (Wildlife Conservation Act, 2009).

A.2. *Main threats*

The lion population in Tanzania is neither endangered nor facing threat of local extinction (Mésochina et al., 2010; Riggio et al., 2012). However, the important number of lions and local human population growth rate places the population at risk to a number of social factors. These include retaliatory, ritual killings and problem-animal control (PAC). These threats won't be addressed by uplisting the lion under the ESA.

a) *Retaliatory and ritual killings*

Direct persecution of lions resulting from human-lion conflict is the single most significant cause of non-natural mortality for the lion in Tanzania. This comes twofold; one, when a lion attacks livestock (and at times humans) and is forcibly killed in protest (through spearing, poisoning, shooting etc.) and two, as pastoral tribes practice ritual carnivore killings.

In the former, each year a few hundred lions are killed by pastoralists in retaliatory killings resulting from lion depredation on livestock (cattle, goats, sheep etc.), and indeed figures have occasionally gone up to >200 in recent years (Wildlife Division database). Retaliatory killings likely occur in every area where there are lions, but available records indicate that the practice is more common in areas adjacent to Tarangire NP, Ngorongoro Crater (NCAA) and unprotected wilderness areas of central and south-eastern of Tanzania (Maddox, 2003; Ikanda, 2006; Ikanda and Packer, 2008). These areas lay exclusively outside protected areas and the effects on lion persistence is thought to affect a mere 20% of the total country lion population (in accordance to lion distribution figures; Mésochina et al., 2010). However, as some killings occurs in areas adjacent to nominally protected area populations, substantial impacts may be inflicted on lion groups ranging in protected areas through hard edge effects (Balme, Slotow and Hunter, 2010).

In the latter, ritual killings are known to still occur within *Maasai*, *Sukuma* and *Barbaig* pastoral groups, but their extent is not known (Ikanda and Packer, 2008; Kissui, 2008). All together an average of 25 lions is killed annually around the Serengeti ecosystem (Maddox, 2003; Ikanda, 2006; Ikanda and Packer, 2008) and 15 lions around Tarangire-Manyara ecosystem (Bernard Kissui, pers. comm.). In central and southern Tanzania figures have gone as high as 40+ lions annually (Baldus, 2004; Dennis Ikanda, pers. comm.).

b) *Problem Animal Control (PAC)*

Lion PAC occurs everywhere around lion populations and involves all reported cases to wildlife officials where lethal control is applied to suppress an ongoing problem of either attacks on livestock or more commonly human attacks (Woodroffe and Frank, 2005; Packer et al., 2005a). In Tanzania, this has mainly occurred in central and southern regions where lions from the Selous and Ruaha-Rungwa ecosystems are traditional man-eaters (Kerbis-Peterhans and Gnoske, 2001; Baldus, 2004; Packer et al., 2005a; Ikanda, 2009). Worst recent outbreaks of man-eating lions occurred between 1995 and 2008,

leading to the lethal control of close to 200 lions (Table I) in seven districts surrounding the two populations.

Table I: Lion PAC in seven Districts of central and southern Tanzania between 1995 and 2008 (Source: Ikanda, 2009)

Year	Mkuranga	Rufiji	Kilwa	Lindi	Ruangwa	Liwale	Singida	Total
1995	0	-	1	2	-	0	1	4
1996	0	1	-	1	0	4	-	6
1997	11	2	1	0	11	-	-	25
1998	3	5	0	1	-	-	-	9
1999	1	5	1	7	0	3	-	17
2000	1	0	2	0	0	-	-	3
2001	1	0	2	1	6	-	-	10
2002	3	3	6	7	4	3	-	26
2003	2	3	1	4	5	2	2	19
2004	7	5	0	8	4	1	3	28
2005	2	2	1	0	2	8	2	17
2006	2	1	0	1	1	4	1	10
2007	0	0	0	3	5	1	-	9
2008	0	6	0	0	0	0	1	8
Total	33	33	15	35	38	26	10	191

-Indicates no data available

B. Factors to be considered in making the Decision for the listing of African lion in ESA

B.1. The Present or Threatened Destruction, Modification, or Curtailment of the Habitat or Range

Habitat and range of lions is documented to be decreasing in a number lion range countries (Henschel et al., 2010; Riggio et al., 2012). However, the situation in Tanzania remains different due to substantial conservation measures which have been put in place to secure and ensure continued protection of wilderness areas, most of which harbour lions (Mésochina et al., 2010). Wildlife habitats cover about 40% of the country's land area and all continue to support lion subpopulations; protected areas network serves as the single largest form of land use in Tanzania. Lion range and habitat in Tanzania has been secured by the establishment of 15 National Parks (covering 4.5% of Tanzania's land area); 28 Game Reserves (13%); Ngorongoro Conservation Area (1%); 44 Game Controlled Areas (5.5%); 38 Wildlife Management Areas (4%); 570 Forest Reserves (15%). New categories of protected areas include Ramsar Sites and Nature Reserves (Appendix I). Commitment to gazette more areas, which are critical habitats for wildlife species, is contained in Tanzania's Wildlife Policy (2007). The protected areas gazetted as hunting areas (295,662 km²) in Tanzania are 5.1 times larger than protected areas without tourist hunting activity (57,838 km²).

Lions range in approximately 750,000 km² of which 55% lies into protected areas and 45% inside non-gazetted areas (Mésochina et al., 2010). However, most individuals (i.e. 80%) range inside protected areas (Mésochina et al., 2010). Only a small portion of the population (20%) continues to roam outside core protected areas, e.g. inside village lands in 35 Districts of mainland.

It is felt that the loss of habitat could not be a threat to lion in Tanzania considering the large system of protected areas and particularly the areas gazetted as tourist hunting areas.

B.2. Overutilization for Commercial, Recreational, Scientific or Education Purposes

The primary form of utilization of the lion is through regulated and managed tourist hunting which fosters sustainable conservation of this species and its habitat. Tourist hunting is conducted in accordance with the Wildlife Conservation Act, 2009 and the Wildlife Conservation (Tourist Hunting) Regulations, 2010. The offtake is done through controlled quota system annually set by a Committee comprising of experts from the Wildlife Division, Tanzania Wildlife Research Institute (TAWIRI), which is the CITES Scientific Authority in Tanzania and some selected academic institutions. The setting of quota is based on data and other relevant information available in terms of species distribution, natural breeding history, recruitment rate and population estimates, which is partly derived from regular conducted censuses, research work and indices as may be reflected in reports from field personnel.

Considering the latest available estimate of lion population size in Tanzania (i.e. 16,800; Mésochina et al., 2010), trophy hunting in Tanzania harvested a yearly mean of 1.9% (min: 1.3; max: 2.5%) of lion males ranging in the country over the past five years (Table II; Wildlife Division database). Long term studies from Serengeti ecosystem established a growth rate of 5% (Packer et al., 2010). The offtake level is very low when compared to national population estimates which justify that tourist hunting is not a threat to lion population in Tanzania. Therefore it is conceivable that the problem of overutilization of the lion through over harvesting is virtually non-existing in Tanzania.

Though the lion population is stable in Tanzania, the harvest level has decreased recently because of the ongoing implementation of the age-based approach to offtake (Table II; Wildlife Division database). It appears that professional hunters are very concerned not to harvest under-aged lions, which explains the reduced harvest level since the 2010/2011 hunting season.

Table II: Lion harvest for trophy hunting over the past five years in Tanzania (Source: Wildlife Division database)

Hunting season	Quota Issued	Harvest of Lion trophy hunting			
		Number	% of Quota Issued (Utilization)	% of lion population (N=16,800)	% of lion male population
2007/2008	511	146	28.6	0.87	2.17
2008/2009	520	165	31.7	0.98	2.46
2009/2010	519	132	25.4	0.79	1.96
2010/2011	315	101	32.1	0.60	1.50
2011/2012	315	85	27.0	0.51	1.26

* a conservative sex ratio of 0.4:1 males was used

B.3. Disease or Predation

Disease or predation do not seem to be a big threat to lions in Tanzania. There have been two known incidences of diseases outbreaks in the Serengeti and Ngorongoro Crater and not documented elsewhere in Tanzania. The species has recovered well in each instance where a disease has caused a short-term decline suggesting good levels of resilience to diseases (Kissui and Packer, 2004; Munson et al., 2008). For example, even after a catastrophic decline of about 30% in the Serengeti population as a result of a canine distemper virus epidemic in 1993–1994 (Packer et al., 1999), the population fully

recovered within a few years (Packer et al., 2005b). Disease and predation are natural factors and will remain whether tourist hunting continues or stops.

B.4. The Inadequacy of Existing Regulatory Mechanisms

Tanzania has put in place numerous regulatory mechanisms aiming at ensuring a healthy population of lions, among other species. These mechanisms are specified in the Tanzania Wildlife Policy (2007); Wildlife Conservation Act (2009); Wildlife Conservation (Hunting Regulations) (2010); and the National Lion and Leopard Action Plan (TAWIRI, 2009).

In regards to lion conservation, Tanzania is the first country out all African lion range states to have officially introduced (i) age-based Regulations and (ii) monitoring and control mechanisms in lion trophy hunting (cf. Section II).

B.5. Other Natural or Manmade Factors Affecting Its Continued Existence

We do not believe that lions are threatened or endangered by any other factor in Tanzania (cf. §A.2. of Section I).

SECTION II. MANAGEMENT AND MONITORING OF LION TROPHY HUNTING IN TANZANIA

A. Introduction

The Africa-wide conservation status of the African Lion (*Panthera leo*) has become a matter of concern at the turn of the century. There is a general consensus recognising the reduction of the distribution range and global population size of the lion in Africa. The continental range of the lion has recently been estimated at approximately 3,000,000 km² (Chardonnet, 2002; IUCN, 2006a & b; Riggio, 2011; Riggio et al., 2012). This represents less than a quarter of its historic range. Recent surveys estimated a loss of about half of the lions in the past three decades. Crude estimates of the historic number of lions in Africa ranged from approximately 400,000 in 1950 (Myers, 1975) to 76,000 individuals in 1980 (Ferrerias and Cousins, 1996). The regional strategies for lion conservation produced by the IUCN (2006a & b) gave an estimated continent-wide lion population of approximately 33,000 individuals. The latest continental assessment available is 32,000 to 35,000 lions (Riggio, 2011; Riggio et al., 2012). However, the conservation status of the lion is extremely heterogeneous with a very broad scale of diverse situations.

Today, Tanzania is recognized as:

- The country having the largest wild free-ranging lion population in the world. The lion population size in Tanzania has been estimated to be about 16,800 individuals according to the latest nationwide survey (Mésochina et al., 2010). This figure is consistent with the next to last estimate (i.e. 17,500, in Ikanda and Packer, 2006). Tanzania may therefore host as many as half of the remaining wild free-ranging African lions (confirmed in Riggio et al., 2012);
- The country with the highest level of conflict between humans and lions (Packer et al., 2005a; Chardonnet et al., 2010);
- The country with the steadily highest number of free-ranging lions harvested by trophy hunting.

As a consequence, the Tanzanian model of wildlife conservation which supports the sustainable use of lion has already shown evidence of greater success than other models that prohibit the sustainable use of lion. Despite of this, Tanzania is in constant search for improving its model.

In Tanzania, wildlife conservation is at first hand a matter of land use. Protected areas gazetted as hunting areas cover about one third of Tanzania and act as prime reservoirs of global biodiversity. In Tanzania, the sustainable use of lion through trophy hunting is not considered as a threat to lion conservation but rather as a strong and steady support to conservation by justifying to set aside extensive surfaces of wilderness.

Fostering the management efficiency of hunting areas is expected to tackle not only the threats to the conservation of the lion, of its prey base and of its natural habitat, but also the threats to the functioning of whole ecosystems and to the provision of ecosystem services of global significance for the planet (Lindsey et al., 2012).

Huntable lions are defined as lions whose harvest has no negative impact on the sustainability of local lion population dynamic. Research has shown that these are typically males five years of age or more that have usually completed at least one breeding cycle (Whitman et al., 2004). In light of the above, Tanzania has decided to implement the following:-

- Introduce an age-based Regulations in lion hunting;
- Strengthen the existing monitoring procedures for lion trophy hunting;
- Develop capacity building within the trophy hunting industry.

Within all the African lion range states, Tanzania has been the first country to officially establish age restriction Regulations in lion hunting at country level. It is clearly stipulated in sections 24(5)(a) and 24(6) of the Wildlife Conservation (Tourist Hunting) Regulations of 2010 that “no person shall hunt lion of an age below six years”. Any professional hunter who guides a client to hunt any lion in contravention of the above Regulations commits an offence and upon conviction is liable for penalties, including cancellation of professional hunters’ license.

The Wildlife Division, Ministry of Natural Resources and Tourism, has since (i) prepared a legal document for enforcing the 2010 Regulations, (ii) gradually improves the monitoring and control mechanisms of lion trophy hunting and (iii) continuously raises the professionalism of the hunting industry. These achievements place Tanzania well ahead of any other lion range state in terms of lion trophy hunting monitoring, control and penalization of offenders.

B. Tourist Hunting Regulations of 2010 and its enforcement

The enforcement of the 2010 Regulations has been developed through a participatory process involving various stakeholders in Tanzania. Given the current state of knowledge regarding the age diagnosis of lion trophies, it is well recognized by the scientific community that lion’s age cannot be assessed without uncertainty (e.g. Whitman & Packer, 2007; Ferreira & Funston, 2010). In Niassa National Reserve, Mozambique, Colleen Begg stated that “*The 4-6 year age category is there because we appreciate that it is often difficult to tell the age of lions in this category as there is a lot of variation.*”(Begg and Begg, 2008). In Zambia, Paula White wrote in an unpublished report that “*While scientists and hunters alike agree that determining the exact age of a wild lion is not possible, assigning individuals to broader age categories is more straightforward*”.

The Wildlife Division has consequently proposed three age-categories of lion trophies in the new Amendment of the Wildlife Conservation (Tourist Hunting) Regulations of 2010 (Figure 1):

- Accepted with awards (6 year-old and above);
- Accepted with penalties (4 and 5 year-old);
- Not accepted with deterrent penalties (under 4 year-old).

The same new document also defines:

- The age categories of lion trophies that can be exported: only trophies assessed to be at least 4 year-old are allowed for export;

- A new aged-based lion quota setting system (Figure 1): lion quotas are set for and allocated to each hunting area according to the age of the lions harvested during the previous hunting season, based on the following system:
 - The quota is increased by 1 when all the lions harvested were 6 years of age and above;
 - The quota is decreased by 1 for each lion harvested with an age of 4 & 5 years;
 - The quota is decreased by 2 for each lion harvested with an age under 4 years.

The rationale of this system is to direct hunting intensity to surplus/huntible lions. This strategy is more penalizing than the Niassa points system (Begg and Begg, 2008).

The Amendment of the 2010 Regulations is underway and will be enforced during the 2012/2013 hunting season. It paves the way to adopt an adaptive management process for trophy hunting as recommended by scientists (e.g. WWF, 1997; Whitman et al., 2004; Lindsey et al., 2012).

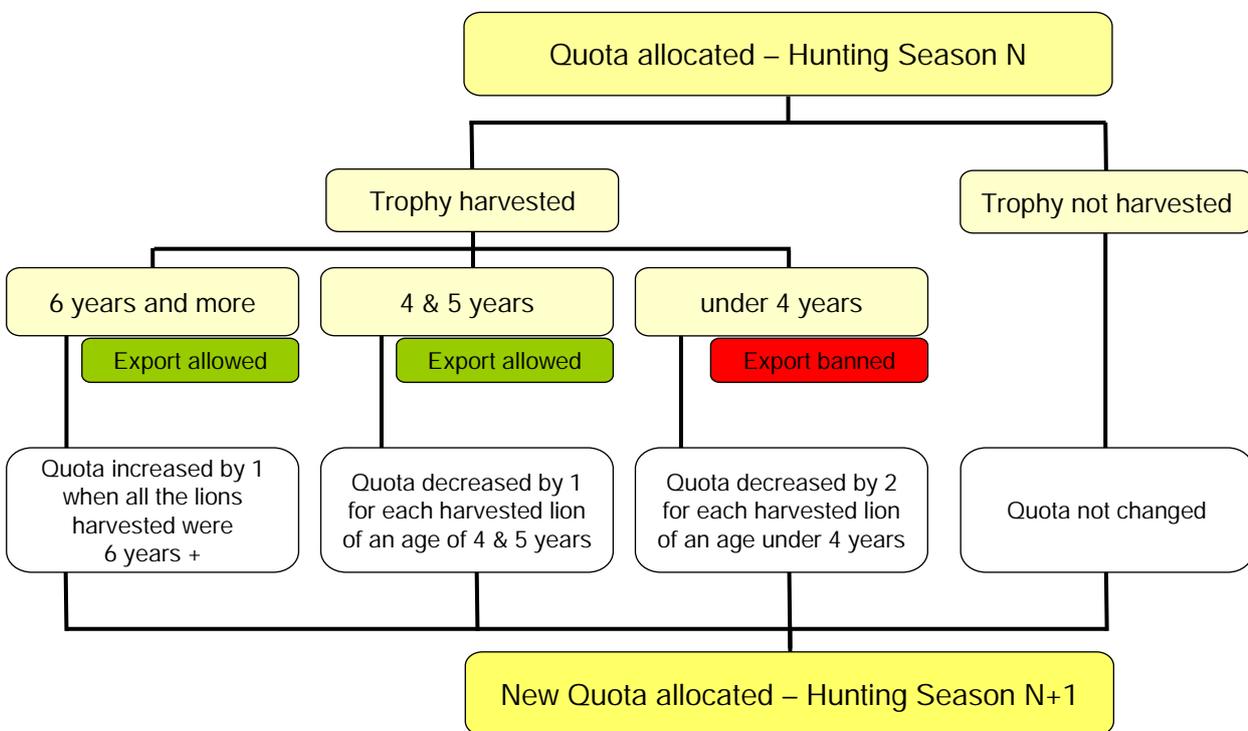


Figure 1: The Wildlife Division System for adjusting the lion quota based on the age of previously harvested trophies

C. Mechanisms for monitoring lion trophy hunting in Tanzania

The monitoring of the lion trophy hunting is carried out through the implementation of a specific database and a specific safari return form (Appendix II). Based on all hunting permits issued by (and compulsorily returned to) the Wildlife Division, a specific database has been set up to record lion trophy harvests. Regularly updated, the database is used to follow-up lion trophy hunting activity and trophy skulls that must be presented to the Wildlife Division for inspection.

Since mid-August 2011, a specific lion safari return form designed by the Wildlife Division is attached to each hunting permit allowing lion harvest (Figure 2). All professional hunters conducting lion hunting safaris are required to fill in the safari return form for both successful and unsuccessful safaris. With this form general information on the course of the safari, the lion population status and lion trophy hunting success are collated. For the successful lion hunting safaris, additional information like the hunting effort, specific measurements (total length and shoulder height) and specified photographs are taken.

Safari return form and trophy photographs are compulsory provided by the hunting companies to the Wildlife Division. No CITES export permit can be issued without compliance.

D. Mechanisms for controlling the age of trophies

Given the current state of knowledge, ageing lion trophies requires the use of subjective and objective criteria. In order to diagnose the age of lion trophies as accurately as possible the Wildlife Division uses the whole set of criteria recommended by the scientific community (Smuts et al., 1978; Cheater, 2006; Whitman & Packer, 2007; Ferreira & Funston, 2010; White, 2010; Niassa Lion Project). However, the research is still on for a more objective method, so the Wildlife Division carefully monitors scientific developments likely to improve the age diagnosis of lion trophies. The Wildlife Division has recently launched a field study to measure various criteria in known age of wild lions in collaboration with the Tanzanian Wildlife Research Institute.

D.1. Inspection of lion trophies

The control of the harvested lion trophies is conducted during so-called ageing sessions (Pictures 1; Figure 2) where hunting operators are requested to bring the skulls of their lion trophies for inspection at the Wildlife Division. This step is compulsory in order to get a CITES export permit.



Pictures 1: Inspection of a lion skull during an ageing session and X-ray of a lion tooth (©Pascal Mésochina)

Upon reception, each skull is identified by a unique code number. A minimum set of 20 pictures of the skull is taken from various angles. The pictures allow potential control of the inspection at a later stage. The inspection of the skull encompasses:

- The measurement of quantitative parameters describing the skull. A set of 15 measurements are taken for describing the skull (e.g. total length, biorbital breadth, canine lengths, etc.). Some of the

parameters measured have been shown to predict the lion's age under three years of age only (e.g. skull total length, *in* Smuts et al., 1978). Some other parameters, to our knowledge, have not been tested yet. The aim of taking new measurements is to test whether new parameters can predict the age of trophies and potentially propose scientific research.

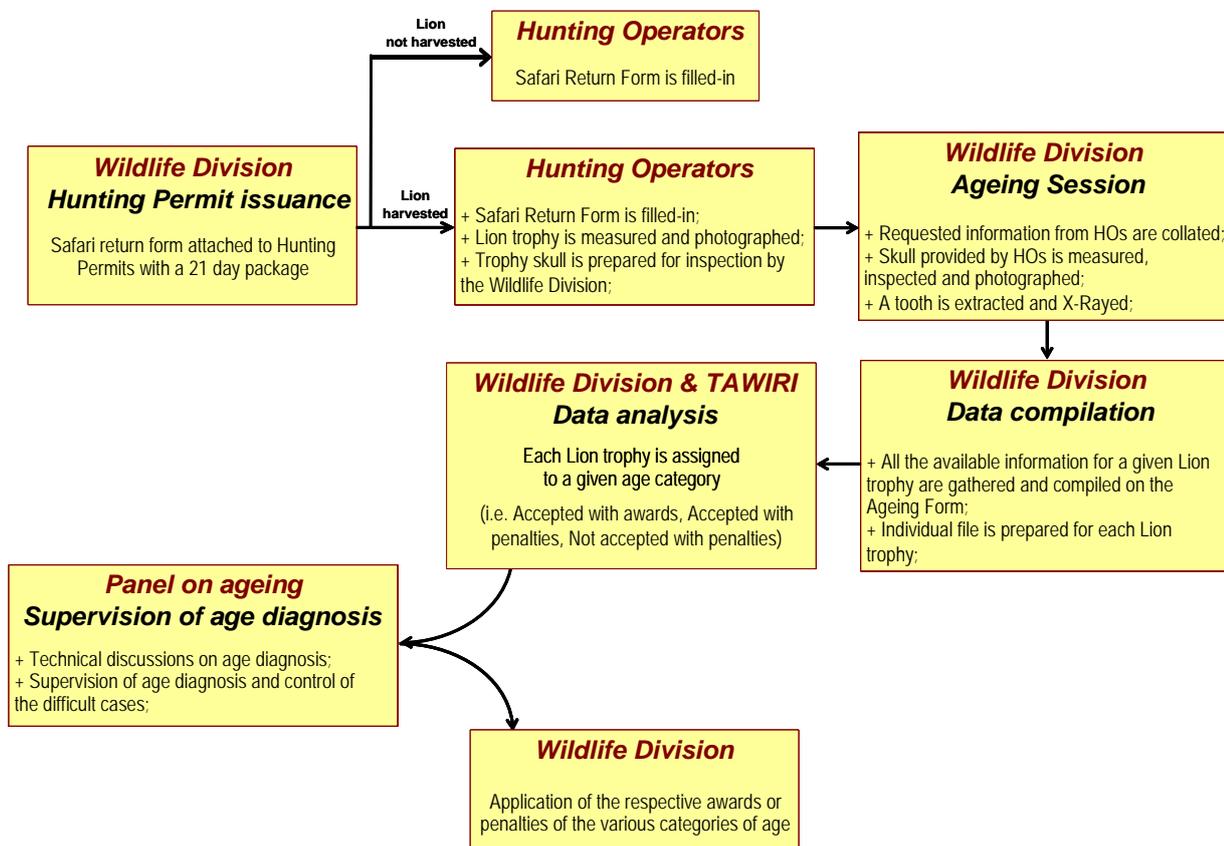


Figure 2: The Wildlife Division mechanism for monitoring and controlling the lion trophy hunting in Tanzania (HOs: stand for Hunting Operators)

- The detailed qualitative inspection of the skull. Each tooth is carefully inspected with regards to its integrity and erosion; additively the integrity and sharpness of the enamel ridges of the canines are assessed, as well as groves on the lower canines. The diagnosis of age is based on published chronologies of tooth eruption and wear in relation to the age of lions (e.g. Smuts et al., 1978; Whitman & Packer, 2007). The closure and obliteration of cranial sutures are also assessed (Smuts et al., 1978).
- The X-ray radiography of an upper pre-molar 2 (PM2). One PM2 is extracted and X-rayed to measure the relative size of the pulp cavity (e.g. Cheater, 2006; Whitman & Packer, 2007). The pulp cavity fills as an individual ages. In lions, the pulp cavity of the upper PM2 is initially wide, and gradually fills as the lion ages. The cavity is closed by approximately 5 years of age (Whitman & Packer, 2007).

All the information recorded during ageing sessions are collated in a specific ageing form (Appendix III).

D.2. Analysis of collated information

Together with the information recorded during the ageing sessions, the measurements of the trophy (safari return form) and the analysis of the photographs taken by the professional hunter are collated in the synthetic ageing form.

In the safari return form, professional hunters are asked to measure the total length and the shoulder height of the lion harvested. Shoulder height is a good predictor of the age of a lion younger than 2 years of age (Ferreira & Funston, 2010).

Photographs of the trophy taken by the professional hunter are used to determine the age of the lion harvested based on (i) mane development, (ii) facial markings, (iii) nose pigmentation and (iv) coloration of canines and incisors (Smuts et al., 1978; Whitman & Packer, 2007; White, 2010; Niassa Lion Project).

A scoring mechanism is then applied to each criterion, resulting in a total score used to assign the lion trophy to an age category.

D.3. Validation of the age diagnosis

The integrative approach used by the Wildlife Division for diagnosing the age of lion trophies has been validated through the organization of blind-tests involving renowned lion experts. Lion experts were provided with photographs and measurements of a few lions harvested during the 2011/2012 hunting season and were asked to age them.

Starting from the 2012/2013 hunting season, the ageing exercise will be supervised by a panel on ageing comprising different networks of stakeholders (i.e. Wildlife Division, Tanzania Wildlife Research Institute, IGF Foundation, College of African Wildlife Management, University of Dar es Salaam, etc.) (Figure 2).

E. Capacity-building of the hunting industry

Before the onset of the 2012/2013 hunting season, the hunting industry was informed of the new document for enforcing the 2010 Regulations regarding lion trophy hunting, trained for improving data collection (two workshops in 2012) and for identifying old enough huntable lions through (i) the production of written guidelines (age diagnosis of the lions in the field and data collection) and (ii) the organizing training sessions (Pictures 2).

F. Preliminary results

F.1. Involvement of the hunting industry

The mechanisms for monitoring and controlling lion trophy hunting are well accepted by the hunting industry in Tanzania. Representatives of the hunting industry were informed of the proposed Amendment of the Tourist Hunting Regulations, 2010. The Wildlife Division regularly explained the context and the rationale of that Amendment to the industry.



Pictures 2: Attendees of the Training Session organized by the Wildlife Division at Peacock Hotel, 14th of June 2012 (©Pascal Mésochina)

As a result, the Hunting industry is committed to fulfil their new duties with regards to lion hunting monitoring and control.

During the **2011/2012 hunting season** (test season):

- Every single lion trophy harvested in Tanzania has been inspected by the Wildlife Division (i.e. 100%);
- Safari return forms were provided for 63 out of the 85 lions harvested (i.e. 74%). Even though the forms were not able to be made available until mid-August, the answer rate for lions harvested after mid-August reached 95%;
- The hunting industry also provided safari return forms for safaris where lions were not harvested (N=158), which helped the Wildlife Division to assess the real hunting success of lion in the country (Table III);
- The answer rate for lion trophy photographs was lower than the one recorded for the safari return forms (23 set of pictures have been provided only, representing 27% of hunted lions). This low answer rate was expected because, due to copyright agreements, samples of photographs to be taken have been provided late in the hunting season (mid-October 2011).

During the first ageing session of **the 2012/2013 hunting season**, organized in November 2012, 37 trophies were inspected. Other ageing sessions are to be organized in January & April 2013, so that the following results are only partial (valid by 15/12/2012 only):

- Safari return forms were provided for all trophies except two (i.e. 94%). The hunting industry also provided safari return forms for safaris where lions had not been harvested (N=163), which will help the Wildlife Division to assess the real hunting success of lion in the country & monitor lion population size trends;
- Lion trophy photographs were provided for 28 trophies (i.e. 82%).

Table III: Calculation of the real lion hunting success in Tanzania during the 2011/2012 hunting season
(Source: Wildlife Division database)

Hunting Permits used (N=1013; 100%)					
Lion requested			No lion requested		
N=511 ; 50.4%			N=502 ; 49.6%		
Active lion search (global estimate from safari return forms)		No active lion search			
N=301 ; 59%		N=210 ; 41%			
Lion harvested (hunting success)	Lion not harvested				
N=85 ; 28%	N=216 ; 72%				

F.2. Transparency

The Wildlife Division has informed the international community about the mechanisms implemented and has involved renowned lion experts to review the age diagnosis process.

The mechanisms for monitoring and controlling lion trophy hunting in Tanzania have been presented to the international community in a number of occasions:

- 10th Annual African Wildlife Consultative Forum, 10-12th October 2011, Swaziland;
- 7th International Wildlife Ranching Symposium, 12-16th October 2011, Kimberley, South Africa;
- General Meeting of the ACP (a Francophone Association of Professional Hunters), 21st October 2011, Paris, France;
- 2nd Workshop of the African Lion Working Group, 10-11th February 2012, Etosha National Park, Namibia.

The Wildlife Division invited three renowned lion experts (Dennis Ikanda, Paula White & Paul Funston) to review the ageing process implemented in Tanzania.

Each expert has received the full set of information collated (measurements of the skull, pictures of the trophy and the skull, X-ray of an Upper Premolar 2) for a number of samples ranging from 5 to 12 and was asked to determine the age of the trophies.

F.3. Development of an age diagnosis tool

Given the current state of knowledge in the methodology for ageing lion trophies, it is well recognized by the scientific community that lion's age cannot be assessed without uncertainty (e.g. Whitman & Packer, 2007; Ferreira & Funston, 2010).

The Wildlife Division, with the intention of improving its age diagnosis methodology, has recently launched a study in collaboration with the Tanzanian Wildlife Research Institute (TAWIRI). The aim of the study is to develop a quantitative age diagnosis tool. It is well known that pulp cavity of teeth closes with age in mammals. Although the relative sizes of pulp cavities in teeth are frequently used to diagnose age of carnivores (e.g. jackal, wolf, Iberian lynx, coyote, lion), the validation of the technique has received little attention.

For the African lion, we lacked a calibration study measuring the degree of closure of pulp cavity in wild specimen of known-age. Long-term studies on lion populations in Northern Tanzania offer a unique opportunity for improving the knowledge in ageing lion, since birth date are known for a significant number of lions.

TAWIRI has conducted a first phase of the study in October 2012 where eight known-age male lions were sampled (including X-Ray of lion teeth). A second phase is to be conducted soon for increasing the sample size.

Once the age diagnosis tool is calibrated, the Wildlife Division plans to adjust (if necessary) the preliminary age diagnoses resulting from former trophy inspections.

G. Conclusions

Tanzania is the first country within the lion range states in terms of free-ranging lion abundance and free-ranging lion trophy hunting. Therefore, the Tanzania model of conservation supporting the sustainable use of wildlife has already shown evidence of better achievement than other models prohibiting wildlife use. To strengthen this model, Tanzania is currently taking strong measures to further improve the conservation and the sustainable use of the lion:

- The country Regulations has been put in place and will soon be enforced through a legal document defining three age categories of lion trophies as well as the various awards and penalties associated to each category, including quota adjustments;
- A new mechanism for monitoring the activity of lion trophy hunting has been (i) tested and gradually implemented in the course of the 2011/2012 hunting season and (ii) fully operational since the onset of 2012/2013 hunting season;
- A new integrative mechanism for ageing lion trophies (i) has been tested and validated between 2011 and 2012 and (ii) is expected to be fully operational in the course of the 2012/2013 hunting season.

SECTION III. POSSIBLE NEGATIVE CONSEQUENCES IF LION IS LISTED IN ESA

Lion is valuable trophy species and is therefore of great importance to the long term survival of tourist hunting industry (Lindsey et al., 2012).

The protection of lion habitats and ranges is justified by, among other reasons, financial returns realized through tourist hunting. It is, therefore, likely that attempts to ban hunting of the species will create disincentive for local communities and hunting industry to protect the natural ecosystems occurring in 23% of the entire country which is protected as hunting areas. For years, hunting companies have played critical roles as partners in protecting lion and its natural habitat in Tanzania. Contributions from hunting companies in rural community development, anti-poaching and hunting block development are estimated at US\$ 1,000,000 annually (Wildlife Division report). Even more importantly, the hunting industry employs a minimum of 1,200 staffs, originating both from rural and urban areas.

Approximately US\$ 40 million is generated annually through the hunting industry in Tanzania, which includes income to outfitters, auxiliary services taxation, Wildlife Division earnings etc. (Wildlife Division report). The revenues that accrue to Wildlife Division, approximately US\$ 10 million per annum (Table IV), are partially used for conservation work. Contribution of lion in generating these revenues is immense, since it is the leading draw in attracting tourists to wildlife destinations. Recent reports indicate that about US\$ 700,000 was earned directly from lion trophy fees. Apart from game fees, a mandatory 21-day safari is required to hunt lion with related concession and other fees regardless of whether or not a lion is taken. As a result, lion hunting in Tanzania can generate a gross amount of US\$ 6 – 7 million per annum. Twenty five per cent of the revenue accrued from game fees is distributed to the Districts with hunting blocks. Between 2004 and 2010 a total of US\$ 2,974,937.9 has been distributed to 44 districts (Appendix IV).

Table IV: Revenue accrued by the Government of Tanzania from tourist hunting between 2000/01 and 2011/12 (Source: Wildlife Division database)

Year	Revenue (US. \$)
2000/2001	9,369,000.00
2001/2002	9,021,000.00
2002/2003	9,322,719.00
2003/2004	8,824,305.00
2004/2005	9,775,459.00
2005/2006	11,621,513.00
2006/2007	12,030,510.00
2007/2008	14,704,370.00
2008/2009	19,760,812.00
2009/2010	18,444,881.00
2010/2011	21,450,223.00
2011/2012	15,052,952.80
Total	159,377,744.80

The United States of America (USA) represents the most important market for trophy hunting in Tanzania with about 67% of clients coming from USA (Wildlife Division database).

Listing the lion as endangered under the US Endangered Species Act would have disastrous consequences for not only the Tanzania economy but also the conservation of biodiversity in the country.

In Tanzania, wildlife conservation is at first hand a matter of land use. Proclaimed protected areas gazetted as hunting areas (i) are 5.1 times larger than protected areas without tourist hunting activity, (ii) cover about one quarter of Tanzania and (iii) serve as prime reservoirs of global biodiversity, securing maintenance of natural ecosystems and prey base for lions.

In Tanzania, wildlife has long been regarded as a liability due to considerable economic and social costs it inflicts to people. However, efforts to transform it to an asset has inspired a significant level of tolerance to these species and, has actually motivated local people to support conservation efforts through setting aside large pieces of their land as Wildlife Management Areas and participating in anti-poaching activities. Listing lion under ESA and its negative consequence on tourist hunting industry will definitely frustrate the investment of efforts pursued for about 30 years which aimed at building strong participation of local communities in conservation of wildlife.

In Tanzania, the human population has significantly increased since 1950 (i.e. 7 million in 1950 against 46 million in 2011) and is projected to increase by 500% or more by 2100 (United Nations, 2011). As a result, there is considerable pressure to convert land to agro-pastoral production, and the pressure is expected to increase tremendously, given the above-mentioned projections from the United Nations. In order to defeat considerable pressure for converting land to agro-pastoral production, wildlife conservation is being advocated as an alternative land use through a philosophy of 'if it pays it stays' or 'use it or lose it.'

If a ban of lion trophy imports into the USA becomes a reality, the sustainability of trophy hunting industry would be threatened by the loss of its main attractive product (lion) combined to the loss of its main market (the USA). A lot of hunting companies operating will returned most (if not all) of their hunting areas to the Wildlife Division to avoid bankrupt. Revenue loss from trophy hunting and, therefore, underfunding of wildlife sector will undermine the capacity of the government to undertake its conservation work including law enforcement. The outcome will be increased illegal activities and loss of key species as observed in the 1970s and 1980s (Wildlife Division report). Furthermore, absence of hunting companies in the hunting areas will imply losing their huge support devoted in maintaining the areas and conducting anti-poaching operations. This will exacerbate wildlife poaching and habitat destruction through deforestation, wild fires, mining, agriculture, livestock grazing, settlements etc. The ultimate impact will be unavoidable extinction of wildlife and natural habitats plus the collapse of ecosystem services (e. g. Lindsey et al., 2012).

SECTION IV. GENERAL CONCLUSIONS

Tanzania is recognized as the first country in terms of (i) abundance of free-ranging lions (Mésochina et al., 2010; Riggio et al., 2012), (ii) conflict between humans and lions (Packer et al., 2005a; Chardonnet et al., 2010) and (iii) number of free-ranging lions harvested by trophy hunting. As a consequence, the Tanzanian model of wildlife conservation which supports the sustainable use of lion has already shown evidence of greater success than other models that prohibit the sustainable use of lion.

In Tanzania, the lions are neither threatened nor endangered under the five factors of the U.S. Endangered Species Act (cf. Section I):

- The loss of habitat and reduction in population are not problems that can be realized in Tanzania which has established 353,500 km² of land in protected areas (i.e. 40% of national mainland), has a stable lion population and a large prey base.
- Trophy hunting in Tanzania harvested a yearly mean of 1.9% of lion males ranging in the country over the past five years. Long term studies from Serengeti ecosystem established a growth rate of 5% (Packer et al., 2010). Therefore it is conceivable that the problem of overutilization of the lion through over harvesting is virtually non-existing in Tanzania.
- The lion has recovered well in each instance where a disease has caused a short-term decline in Tanzania suggesting good levels of resilience to diseases (Kissui and Packer, 2004; Munson et al., 2008).
- Tanzania has put in place numerous regulatory mechanisms aiming at ensuring a healthy population of lions, among other species. In regards to lion conservation and management, Tanzania has established a national lion action plan (TAWIRI, 2009) and is the first country out all African lion range states to have officially introduced (i) age-based Regulations and (ii) monitoring and control mechanisms in lion trophy hunting (cf. Section II).
- The main threat to lion survival, namely illegal killing for various reasons such as ritual killing, snaring for bushmeat, retaliation in reaction to human casualties and livestock losses, etc, won't be addressed with trade restrictions. As detailed in Section III, we even believe that listing the lion in the ESA could impair not only the conservation status of the lion but also the integrity of vast natural ecosystems in Tanzania. The willingness of American clients to pay to hunt lions represents an opportunity for natural resource conservation in the context of severe funding shortages to protect and manage African wilderness.

We therefore believe that a reform of lion trophy hunting, such as the one implemented in Tanzania, is preferable to trade restrictions.

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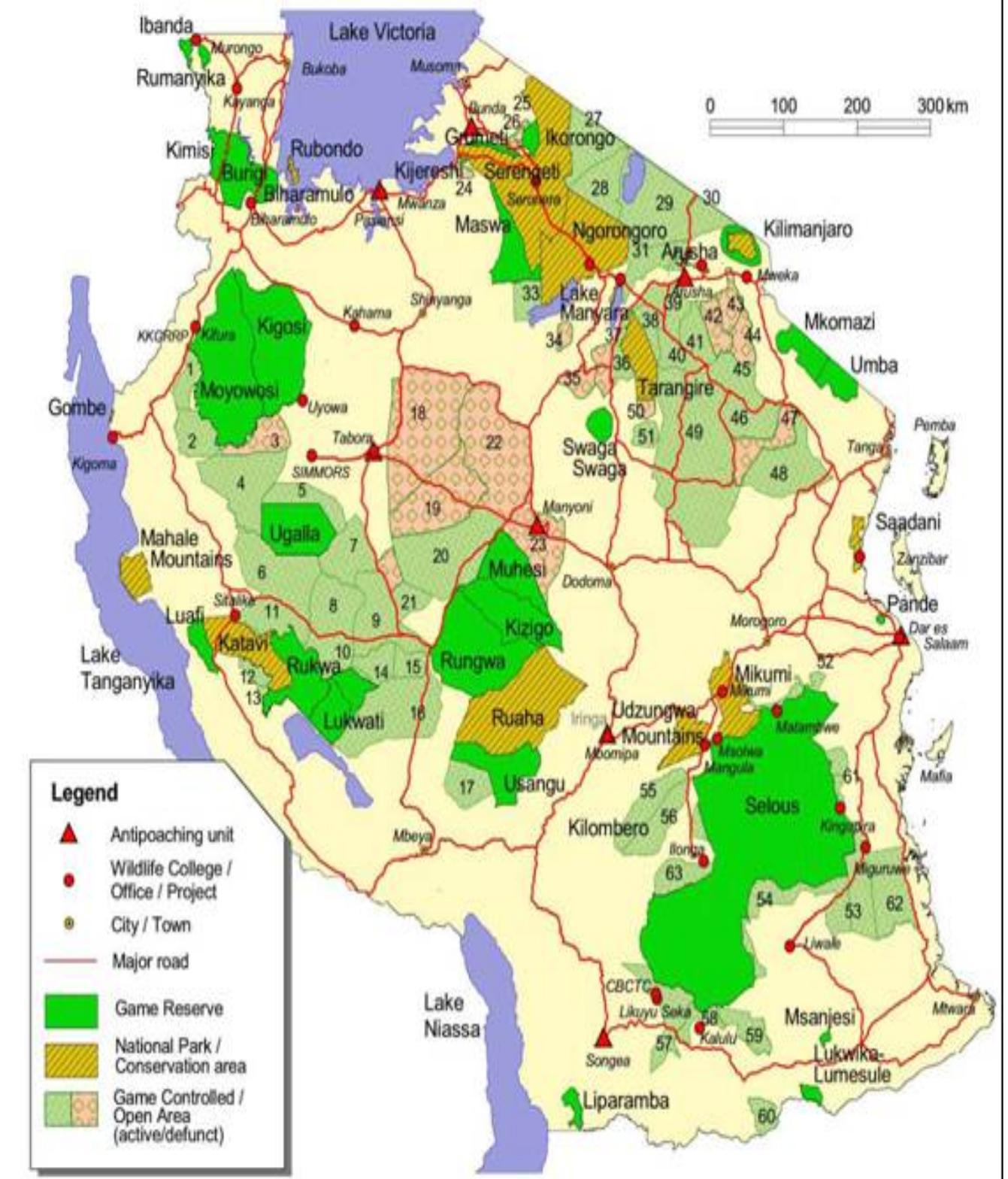
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APPENDICES

Appendix I: Protected Area network in Tanzania



Appendix II: Lion Safari Return Form



MONITORING OF LION TOURIST HUNTING - SAFARI RETURN FORM - PLEASE FILL OUT ONE FORM FOR EACH LION SAFARI



Date (month/year):	
Hunting Area:	
Safari Hunting Company:	
Professional hunter:	
Client name and nationality (optional):	
Hunting permit number:	

COURSE OF THE SAFARI

Type of Safari (number of hunting days):	<input type="checkbox"/> 21 days	<input type="checkbox"/> Other:			
Have you effectively looked for a lion to hunt during the Safari?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
Number of effective hunting days:					
Estimated number of kilometers covered during the Safari:	By car	By foot	Total		
	+		=		
Number of different <u>solitary lions</u> seen during the Safari:					
Number of different lion <u>prides</u> seen during the Safari:					
Total number of different <u>individual lions</u> seen during the Safari (solitary + in pride):	Adult		Sub-adult	Cub	Total
	Male	Female			
	+	+	+	=	
Number of different "trophy lions" seen during the Safari:					

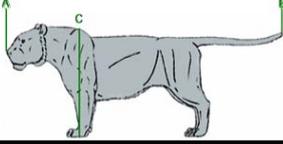
IF A LION WAS HARVESTED

Date of harvest:		
How many hunting days were needed for harvesting the lion?		
Location of harvest (GPS in decimal degrees):	GPS S:	
	GPS E:	
Give your own estimate of the lion' age:		
Condition of the lion harvested:	<input type="checkbox"/> Healthy	<input type="checkbox"/> Wounds
	<input type="checkbox"/> Thin	<input type="checkbox"/> Snares

REMARKS:

... See next page

TROPHY MEASUREMENT AND PHOTOGRAPHY

Total length (A-B: tip of the nose to end of the tail):  cm

Shoulder height (C: tip of scapula to back of plantar pad): cm



Side view showing the entire body with the hunter positioned directly behind for scale



Side view of the head, neck and shoulder showing mane development



Head down, showing mane development on head and shoulder



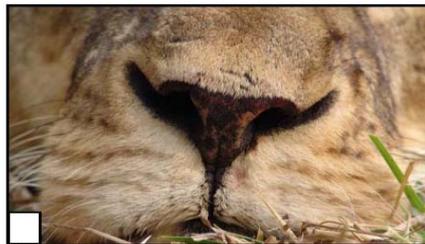
Head up, showing mane development on throat and chest



Face head, showing shape and scars



Frontal view of the teeth, showing coloration and wear on canines and incisors. At time of hunt for color!



Nose, not too close and clearly showing the pigmentation. At time of hunt for color!

BIOLOGICAL SAMPLING

Please note that two blood and two skin samples are required per lion.

Blood sample: Place the filter paper on bullet wound or another source of blood until blood soaks through, air dry for 10-15 minutes in the shade, place in a small plastic bag inside the larger plastic bag and store in a cool place.

Skin sample: Cut a small piece of skin (3-4mm), place it into a tub filled with alcohol 70 or 90° (ethanol) and put the tub in the larger plastic bag.

...thanks for your help!

Appendix III: Ageing Form



Lion Hunting Monitoring Programme in Tanzania - Trophy Ageing Form -



Code Number: Inspection Date:

Photographs and measurements taken by professional hunters							scoring			
Body						-	-/+	+		
Body	Total length (body+tail, cm)					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Shoulder height (cm)									
Mane	Head		Between ears							
	Shoulder		Behind ears					<input type="checkbox"/>		
	Throat		Chest							
Head	Facial scars					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Facial fur					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Nose pigmentation (%)					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Teeth	Canine color	<input type="checkbox"/> bright white	<input type="checkbox"/> yellowed	<input type="checkbox"/> yellow		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Incisor color	<input type="checkbox"/> bright white	<input type="checkbox"/> yellowed	<input type="checkbox"/> yellow		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Measurements and radiography taken by the Wildlife Division							scoring			
Skull	Total length (cm)		Height (cm)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Skull	Total width (biorbital breadth, cm)		Nasal suture length (cm)							
	Least interorbital breadth (cm)		Weight (kg)							
Skull	Suture	Interparietal:		Interfrontal:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Teeth	Integrity		Intact	Cracked	Chipped	Broken	Missing			
	Canines	Upper _{LR}								
		Lower _{LR}								
	Incisors	Upper _{LR1-3}						<input type="checkbox"/>	<input type="checkbox"/>	
		Lower _{LR1-3}								
	Premolars	Upper _{LR2-4}								
		Lower _{LR3-4}								
	Erosion		Minor	Mild	Medium	Deep	Very Deep			
	Canines	Upper _{LR}						<input type="checkbox"/>	<input type="checkbox"/>	
		Lower _{LR}								
	Incisors	Upper _{LR1-3}						<input type="checkbox"/>	<input type="checkbox"/>	
		Lower _{LR1-3}								
	Premolars	Upper _{LR2-4}						<input type="checkbox"/>	<input type="checkbox"/>	
		Lower _{LR3-4}								
	Molars	Lower _{LR1}						<input type="checkbox"/>	<input type="checkbox"/>	
Canine color		<input type="checkbox"/> bright white	<input type="checkbox"/> yellowed	<input type="checkbox"/> yellow			<input type="checkbox"/>	<input type="checkbox"/>		
Incisor color		<input type="checkbox"/> bright white	<input type="checkbox"/> yellowed	<input type="checkbox"/> yellow			<input type="checkbox"/>	<input type="checkbox"/>		
Canines	Ridges	Side	Jaw	Integrity		Sharpness				
				Left	Right	Left	Right	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Back	Upper						<input type="checkbox"/>	<input type="checkbox"/>
			Lower						<input type="checkbox"/>	<input type="checkbox"/>
	Internal	Upper						<input type="checkbox"/>	<input type="checkbox"/>	
		Lower						<input type="checkbox"/>	<input type="checkbox"/>	
	Gum recession (cm)		UCL:	UCR:	LCL:	LCR:				
	Length (cm)		UCL:	UCR:	LCL:	LCR:				
	Grooves		LCL:	LCR:				<input type="checkbox"/>	<input type="checkbox"/>	
	PM2 X-Ray	Pulp cavity ratio <input style="width: 50px;" type="text"/>		<input type="checkbox"/> very wide	<input type="checkbox"/> wide	<input type="checkbox"/> moderate	<input type="checkbox"/> narrow	<input type="checkbox"/> closed	<input type="checkbox"/>	<input type="checkbox"/>
Clearly unacceptable <input type="checkbox"/>		Tolerated <input type="checkbox"/>		Clearly acceptable <input type="checkbox"/>		# -	# -/+	# +		
Remarks:										

Appendix IV: Distribution of 25% revenue generated from game fees between 2004/05 and 2010/11

DISTRICT	REVENUE IN USD							
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	TOTAL
DED - ARUMERU	-	2,078.9	747.9	1,012.5	3,052.8	-	-	6,892.1
DED - BABATI	-	5,696.7	3,636.1	1,749.6	1,234.7	3,494.8	5,652.3	21,464.3
DED - BARIADI	-	4,167.2	2,031.2	561.7	11,772.5	10,846.4	16,361.9	45,740.9
DED - BIHARAMULO	-	1,427.0	2,021.7	1,016.0	1,800.0	921.4	1,647.8	8,833.9
DED - BUNDA	-	7,162.5	4,595.0	2,896.2	15,429.6	11,532.8	17,379.5	58,995.5
DED - HANDENI	-	3,477.3	-	-	-	-	-	3,477.3
DED - IGUNGA	-	2,514.8	1,185.6	495.4	-	835.3	1,520.3	6,551.4
DED - IRINGA VIJIJINI	-	2,640.2	4,764.9	1,855.3	4,761.3	9,522.9	14,399.8	37,944.5
DED - KAHAMA	-	2,384.4	690.8	853.0	3,923.0	1,108.7	1,925.6	10,885.4
DED - KARAGWE	-	965.2	391.7	306.7	4,447.6	671.7	1,277.7	8,060.6
DED - KASULU	-	2,103.5	1,026.4	489.3	904.2	1,601.9	2,656.7	8,782.0
DED - KIBONDO	-	4,512.3	1,897.6	1,570.3	3,928.6	4,041.9	6,274.2	22,224.9
DED - KIGOMA VIJIJINI	-	6,126.6	1,402.4	2,268.4	-	-	-	9,797.4
DED - KASARAWE	-	3,455.3	3,257.4	1,324.4	1,417.4	-	-	9,454.4
DED - MASASI	-	3,848.4	2,156.9	1,786.5	-	-	-	7,791.8
DED - NANYUMBU	-	-	-	-	5,462.8	9,062.5	7,001.4	21,526.7
DED - NKASI	-	3,520.3	2,494.9	2,959.8	3,061.7	4,254.7	6,589.5	22,881.0
DED - KILOMBERO	7,734.1	21,077.4	23,032.2	9,211.5	25,972.7	18,779.8	28,123.3	133,931.0
DED - ULANGA	17,018.9	28,174.4	21,982.1	9,717.0	20,919.8	13,257.0	19,935.8	131,005.1
DED - LIWALE	-	27,135.2	27,619.0	10,199.7	30,477.8	25,097.4	37,489.4	158,018.4
DED - KILOSA	-	1,245.9	1,227.7	291.9	1,734.7	1,481.9	2,478.8	8,460.8
DED - SONGEA	-	9,857.8	1,451.9	2,333.4	4,185.3	3,685.5	5,745.8	27,259.7
DED - RUFUJI	-	13,250.2	16,786.6	5,924.1	18,323.1	15,164.8	22,764.0	92,212.8
DED - IRAMBA	-	2,514.8	1,185.6	495.4	-	-	-	4,195.8
DED - MEATU	-	18,827.3	17,275.1	7,599.8	26,407.1	31,531.2	47,027.6	148,668.2
DED - MOROGORO VIJIJINI	-	3,433.9	8,684.8	759.5	3,296.3	2,983.2	4,704.5	23,862.2
DED - BUKOMBE	-	1,067.2	712.8	272.7	3,923.0	1,108.7	1,925.6	9,009.8
DED - KONDOA	-	-	1,804.6	1,050.1	-	-	-	2,854.8
DED - NAMTUMBO	-	-	7,006.6	3,267.8	10,692.8	11,007.8	16,601.2	48,576.2
DED - TUNDURU	14,206.6	21,357.8	15,881.2	7,458.3	10,013.9	11,138.6	16,795.1	96,851.5
DED - KILWA	-	12,829.2	19,913.9	8,616.5	-	14,364.0	21,576.8	77,300.3
DED - MBARALI	8,410.8	19,706.3	17,667.6	6,118.3	-	-	-	51,903.0
DED - CHUNYA	13,753.1	16,060.5	15,981.7	7,546.4	49,808.9	30,629.9	45,691.5	179,471.9
DED - MANYONI	29,918.3	14,075.1	13,620.5	11,787.8	-	-	-	69,401.7
DED - URAMBO	15,345.4	19,474.6	16,518.3	9,077.0	9,489.8	-	-	69,905.1
DED - SIKONGE	-	7,184.1	12,644.2	6,217.4	16,767.8	24,236.4	36,212.9	103,262.8
DED - KILINDI	-	-	2,934.2	1,850.3	-	-	-	4,784.5
DED - MONDULI	28,823.1	22,761.9	15,550.2	16,131.3	53,412.7	39,618.9	59,017.8	235,315.9
DED - NGORONGORO	17,204.3	5,336.7	7,805.4	7,560.5	32,268.3	34,757.0	51,809.9	156,742.1
DED - SIMANJIRO	9,818.3	28,287.6	11,742.5	9,637.5	31,625.5	30,314.1	45,223.3	166,648.8
DED - KITETO	17,204.3	14,782.6	2,890.1	4,212.7	10,483.3	6,845.5	10,430.4	66,848.9
DED - SUMBAWANGA	-	5,592.2	1,806.3	2,041.4	7,187.0	6,771.7	10,321.1	33,719.8
DED - SERENGETI	-	14,118.8	5,418.8	5,153.4	25,897.3	21,301.6	31,862.1	103,752.1
DED - MOROGORO	19,828.5	4,148.9	-	-	-	-	-	23,977.4
DED - MPANDA	-	30,129.2	12,280.5	11,991.7	37,066.6	33,010.7	49,221.0	173,699.6
DED - LONGIDO	-	-	-	-	1,113.0	27,429.6	37,325.9	65,868.5
DED - MULEBA	-	-	-	-	1,800.0	-	-	1,800.0
DED - MANYONI	-	-	-	-	42,582.9	41,378.7	61,626.8	145,588.5
DED - KILWA	-	-	-	-	19,604.1	-	-	19,604.1
DED - URAMBO	-	-	-	-	-	11,621.4	17,510.9	29,132.3
TOTAL CONTRIBUTION	199,265.6	418,510.3	333,724.9	187,668.8	556,250.0	515,410.1	764,108.3	2,974,937.9

*DED- District Executive Director