

UNITED REPUBLIC OF TANZANIA

MINISTRY OF NATURAL RESOURCES AND TOURISM

Wildlife Division



TANZANIA WILDLIFE RESEARCH INSTITUTE (TAWIRI)



**Non-detriment findings on African lion (*Panthera leo*) in the
United Republic of Tanzania, including Enhancement findings**

June 2016

TABLE OF CONTENTS

1. Introduction	4
2. The distribution of African lion (<i>Panthera leo</i>) in Tanzania	5
2.1 Distribution	5
3. Population status, census methodologies and recent surveys.	8
4. Legislation and Enforcement	10
4.1 Stakeholders in the conservation of lion.	11
5. Safari Hunting in Tanzania	12
5.1 Lion hunting in Tanzania	14
5.2 Hunting Regulations of 2015 and their enforcement	14
5.3 Capacity-building of the hunting sector	16
5.4 Involvement of the hunting sector in Lion Conservation	16
5.5 Transparency	17
6. Lion hunting quotas and monitoring	19
6.1 Hunting quotas	19
6.2 Mechanisms for monitoring lion hunting in Tanzania and mechanisms for controlling the age of trophies	21
6.3 Aging System	22
6.3.1 Inspection of lion trophies	25
6.3.2 Analysis of collated information	27
6.3.3 Validation of the age diagnosis	27
6.3.4 Development of an age diagnosis tool	28
7. Annual harvest levels and international trade	29
7.1 Harvest levels	29
7.2 International trade	32
8. Lion Management	33
8.1 Management Plans	34
9. Threats	35
9.1 Human-lion conflict	35
9.2 Habitat loss	38
9.3 Poaching	39
9.4 Bushmeat Poaching and Prey Abundance	39
Figure 12 Ungulates estimates in the Selous-Mikumi Ecosystem 2009 and 2014	40
10. Community partnership, benefit and participation	42
10.1 Overview	42
10.2 Policy Achievements	45
10.3 WMAs benefits	47
11. Revenues and expenditure from safari hunting	47
11.1 Revenue from US hunters specific to lions	49
11.2 Expenditures by Wildlife Division	52
12. Conclusions and Non-Detriment Findings	53
13. References	55

APPENDIX 1 Assessment of the Enhancement and Non-Detriment Findings against the IUCN SSC “Guiding principles on trophy hunting as a tool for creating conservation incentives. Ver. 1.0. IUCN SSC (2012)”	59
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APPENDIX 2 - Reference Table to the USFWS Letter and Questionnaire on Lion in Tanzania	69
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ANNEXES:

ANNEX 1 Letter of the Wildlife Division to IUCN

ANNEX 2 Tourist Hunting Regulations 2015

ANNEX 3 Action Plan for the African Lion and Leopard

ANNEX 4 Dangerous Animals Damage Consolation Regulations 2011

ANNEX 5 AAC 5 years Strategic Plan

ANNEX 6 WMA Implementation Strategy

ANNEX 7 Letter of the Director of Wildlife on Lion quota reduction, 2016

1. Introduction

The Government and citizens of Tanzania are aware of dependency on natural resources for its livelihoods and socio-economic development. In recent years Tanzania has achieved high overall economic growth due in part to expanding mining and tourism industries, the latter being largely based on terrestrial wildlife, coastal and marine attractions. Government believes tourism, both consumptive and non-consumptive, holds great potential for the socioeconomic development of the country including rural communities through, for example the operations of Wildlife Management Areas in which private companies can invest.

Sustainable management of natural resources is high on the national development agenda.

In this regard, lion has an important role not only as an apex terrestrial carnivore in the Tanzanian ecosystems, but also as a potential provider of economic benefits through its sustainable use both consumptive and non-consumptive.

Lions fill an essential niche in numerous large African predator-prey relationships. The species also ranks very highly amongst preferred animals for tourists. At the same time lions are also important trophy animals in areas where tourist hunting safari operations are conducted.

Apart from the lion's ecological role in the ecosystem, the lion is also an important economic species which brings in a substantial amount of money to the tourist industry. This includes the tourist hunting safari sector.

Tanzania holds the most important lion population in Africa and on Earth and bear this responsibility with improved strategies to maintain this and other species to levels that are not detrimental to their survival; these strategies encompass a variety of conservation issues, such as Community-Based Conservation, Anti-Poaching, Protected Areas and Wildlife Management in general.

Importantly, to give a new impetus to conservation strategic activities, the Government of Tanzania has decided in 2014 to establish the Tanzania Wildlife Authority (TAWA) in order to improve efficiency and effectiveness in managing wildlife resources and their habitats. TAWA is an autonomous body responsible for undertaking conservation of wildlife resources and biodiversity outside National Parks and Ngorongoro Conservation Area. TAWA was officially inaugurated in October 2015 and at the time of writing this NDF (June 2016) the transition of management activities from the Wildlife Division (WD) to TAWA is taking place. Most of TAWA's funding will come directly from user fees such as hunting license fees, hunting block fees, game fees and daily conservation fees. The viability of TAWA will depend on sufficient revenue from safari hunting.

Sustainable utilization, in the form of highly selective and well-monitored safari hunting, can provide the needed revenues to achieve the goals of these strategies. The proceeds from lion safari hunting¹ are re-invested into conservation and sustainable development in local communities. In this way, sustainable sport-hunting of lions provides direct benefits to both conservation of Tanzania's wild lion populations and the people living with the lions in their areas thereby promoting conservation ethics at the national and local level.

¹In this document the term Safari Hunting or Tourist Hunting is used and preferred over the term "Trophy Hunting", as the ultimate goal of this hunting is not the pursue for the bigger "trophy", but rather a touristic, recreational and conservation activity.

2. The distribution of African lion (*Panthera leo*) in Tanzania

2.1 Distribution

In Tanzania, wildlife conservation is at first hand a matter of land use. The lion range and habitat fall within the wildlife protected areas, covering about 40% of the country's land area. Wildlife protected areas is the single largest form of land use in Tanzania. Tanzania has different categories of protected areas that are administered by different authorities. They include 16 National Parks, 28 Game Reserves, the Ngorongoro Conservation Area, 44 Game Controlled Areas, 38 Wildlife Management Areas, and 570 Forest Reserves. New categories of protected areas include Ramsar Sites and Nature Reserves. Commitment to gazette more areas, which are critical habitats for wildlife species, is contained in Tanzania's Wildlife Policy (URT 2007) and the Wildlife Conservation Act No.5, 2009.

Protected areas gazetted as hunting areas (304,400 km²) are ca. 5 times larger than protected areas without safari hunting activity (57,838 km²) (Figure 1). The Total of Protected areas is more than 360,000 km². Protected areas gazetted as hunting areas cover about one third of Tanzania and serve as prime reservoirs of global biodiversity, securing maintenance of natural ecosystems and prey base for lions.

Therefore, the figures reported on page 80017 of Final Rule are not correct i.e. *“For example, in Tanzania, 25–33 percent of the total area, covering over 247,000 km² and encompassing 190 hunting units, has been set aside for sport hunting purposes; this has resulted in an area 5.1 times greater than Tanzania's fully protected and gazetted parks (Jackson 2013, p. 6; Barnett and Patterson 2005, p. 61).”* The total area set aside for sport hunting covers 304,400 km² and not 247,000 km². Also the statement, in the same page, that these hunting areas are not ameliorating the threat of habitat loss, is incorrect as explained below. Habitat loss is not considered a threat to lion in Tanzania, although the issue of human encroachment on protected areas is being addressed including with the support of hunting operators.

The latest comprehensive global assessment of the lion range in Tanzania covered an area of 816,790 km², i.e. 92.4% of the terrestrial land in Tanzania (Mésochina et al. 2010). This assessment showed a permanent presence range for lion of 516,900 km², i.e. 69% of the documented lion range, and a temporary presence range of 232,800 km², i.e. 31% of the documented lion range (Figure 2, more details provided in Mésochina et al. 2010). A more updated range assessment exercise which led to similar results can be found in Hamunyela et al 2013.

There are four main subpopulations of lions in the country:

- a) Maasailand Ecosystem, mostly in Mara, Arusha, Kilimanjaro and Manyara Regions (north-eastern of Tanzania);
- b) Kagera and Kigoma Regions (north-western of Tanzania);
- c) Rukwa, Tabora and Mbeya Regions (central and western Tanzania);
- d) Selous Ecosystem, mostly in Lindi, Morogoro and Ruvuma Regions (southern Tanzania).



THE UNITED REPUBLIC OF TANZANIA



Ministry of Natural Resources and Tourism
Wildlife Division



1 : 1,500,000

- ▲ Antipoaching Zone Headquarter
- Hunting Blocks Boundaries
- National Boundary
- National Parks
- Game Reserves
- Ngorongoro Conservation Area Authority
- Community Wildlife Management Areas
- Lakes and Ocean

- ANTIPOACHING UNITS
- Arusha
 - Bunda
 - Dar es Salaam
 - Iringa
 - Manyoni
 - Mwanza
 - Songea
 - Tabora

Grid : Degrees
Projection : Mercator
Spheroid : Clarke 1880 (Modified)
Unit of Measurement : Meter
Central Meridian : 29 Degrees East of Greenwich
Latitude of Origin : Equator
Scale Factor at Origin : 0.9996
False Easting : 500,000
False Northing : 10,000,000
Datum : New Arc (1960)

MAPPING BASE

The Map of Natural Resources and Tourism second edition drawn by Forest Division, 1974. Boundary of the Protected Areas as described in the Wildlife Conservation Act (No. 5 of 2009). Topographic Standard Sheets Scale 1 : 50,000. Global Position System (GPS) co ordinates and tracks of Hunting Blocks and Infrastructures.

Drawn by : Dr. S.G.J. Mafule .11th January, 2008
Revised 19th April, 2016. Phone +255 765901072
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Figure 1: Network of Protected Areas in Tanzania (Source: TAWIRI)

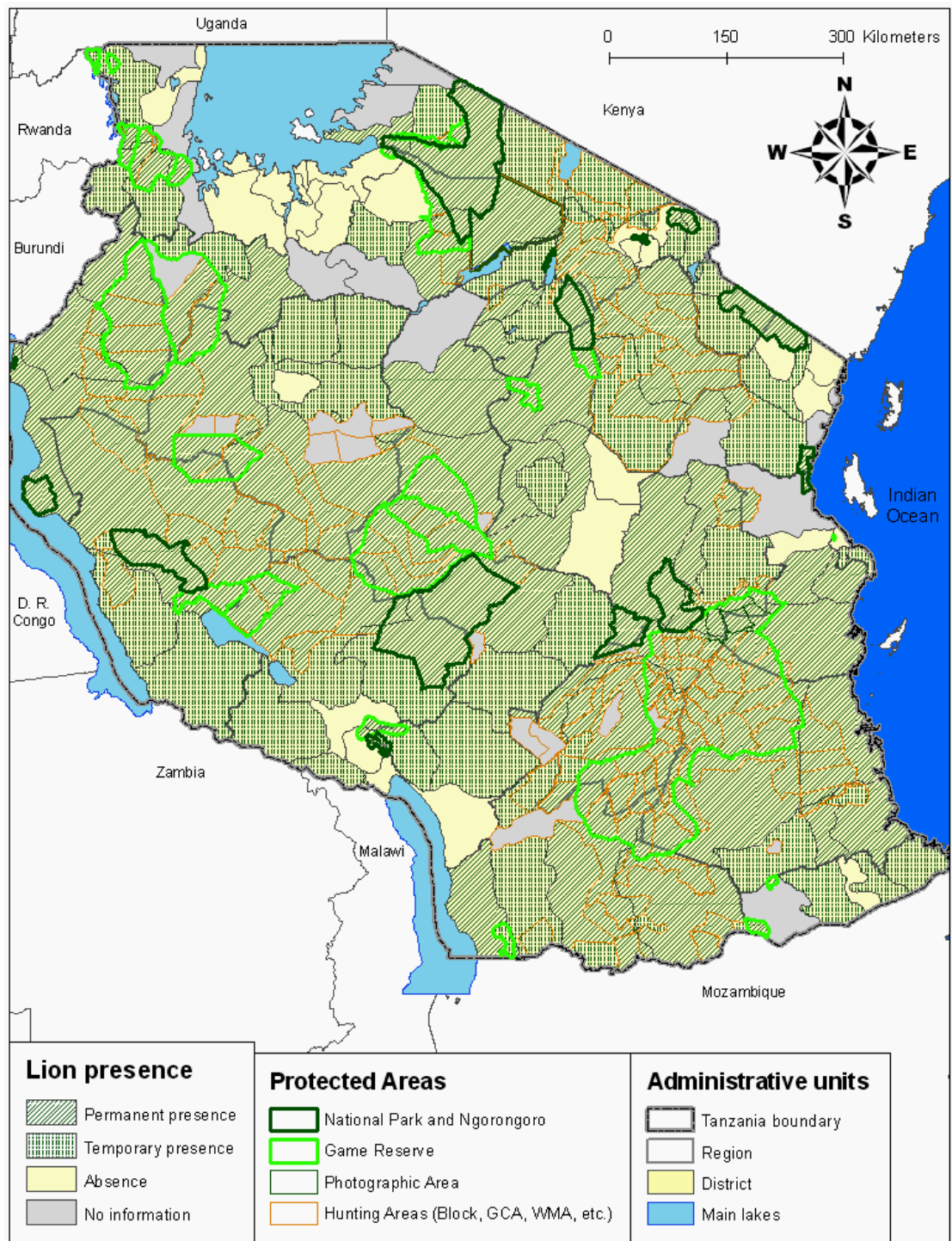


Figure 2: Lion range in Tanzania (by January 2010) for the period 2005-2010. (from Mesochina et al 2010)

3. Population status, census methodologies and recent surveys.

The latest nationwide lion estimates were provided by Ikanda and Packer (2006), and Mésochina et al. (2010). Ikanda and Packer (2006) proposed an estimate of lion abundance of 17,564 [12,208 - 19,320], and Mésochina et al. (2010) and estimate of 16,800.

In the 2010 Mésochina study (2010), a georeferenced database has been set up to collect and analyze the information available (250 bibliographic references) as well as the information generated by specific inquiries (among 321 informants).

According to this assessment, the estimated lion population size of these main subpopulations in 2010 was:

3,700 in the Maasailand Ecosystem;

520 in Kagera and Kigoma Regions;

2,300 in Rukwa, Tabora and Mbeya Regions;

7,200 in the Selous Ecosystem.

Table 1 presents the list of lion census surveys carried out in Tanzania between 2005 and 2015.

In 2014, the Wildlife Division in collaboration with TAWIRI (Tanzania Wildlife Research Institute), launched a national large carnivores survey with the objective to monitor the status and population trends of lion, and other large carnivores, in the safari hunting areas of Tanzania, i.e. Game Reserves, Game Conservation Areas, and Open Areas, in a sample of hunting blocks over the main ecosystems of the country, i.e. Tarangire Manyara, Malagarasi-Moyowosi, Ruaha-Rungwa, and Selous Game Reserve:

- Prior to the surveys, a training workshop on large carnivores census methodologies took place in Lake Manyara National Park, on the 29th–31st July 2014, for 15 ecologists and managers of the Wildlife Division, TAWIRI, and TANAPA (Tanzania National Parks), with a special focus on the track incidence methodology (Funston et al. 2010). This methodology relies on the identification and the count of the spoor left on the ground by the large carnivores along portions of roads and rivers called transects. This is the key standardized technique applied to estimate lion abundance in locations where they are shy and elusive to the presence of humans. Tanzania utilizes also the standardized methodology of call-up surveys but preferentially long term observations of known individuals in Serengeti NP, Ngorongoro CA, and Tarangire NP has served as the primary technique of counting lions.

In 2014 and 2015, two major lion populations were surveyed, in Maasai Steppe Ecosystem (the Simanjiro Plains) and in the Selous Game Reserve:

- In the Maasai Steppe Ecosystem, two surveys were carried out in the Simanjiro Plains: (i) one in the dry season, in August-September 2014; (ii) one in the wet season in April-May 2015, in order to capture possible changes in lion densities due to seasonal movements of prey, hence lions too, in and out of Tarangire National Park. The sample comprised four hunting blocks, 5,386 km² of the 26,708 km² (i.e. 20%) covered by the hunting blocks on the eastern border of the Tarangire National Park. In the Tarangire National Park, there is already an ongoing lion project that provides regular population estimates. Results of the sampled portion of the Maasai Steppe provides an estimate of 1.3 lions x 100 km² (Equivalent to about 70 lions). The area is a key hotspot of human-lion conflict in Tanzania and lions suffer periodic persecution from Maasai pastoralists which explains the low density.

The final results are not yet available because the Simanjiro Plains are only a part of the Massai Steppe, and cannot therefore be representative of the entire ecosystem.

- In the Selous Game Reserve the survey took place in the typical dry season 2014, October- November 2014, over 10 of the 48 blocks of the Reserve. It covered several sectors, and included the two management regimes, i.e. photographic and hunting, for a total area of 11,385km², i.e. 25% of the Reserve. An additional survey took place during the 2015 wet season, in March 2015, in the photographic part of the Reserve. Results are given in table 1 and the final results has been submitted to a scientific journal awaiting publication.

Table 1: Summary of available lion population census surveys **since 2005** in Tanzania.

	Lion population	Management Regime	Size (Km2)	Last survey	No. surveys	Density (No./100 km2)	Source	Pop. Trend
0.	Countrywide	All	816,790	2010	N/A	Variable	Mesochina 2010	Estimate 16.800
1.	Selous	Hunting	44,200	2015	3	3.8-4	Crosmary et al (In prep.)	Stable
2.	Selous	Photographic	800	2015	4	9	Crosmary et al (In prep.)	Stable
3.	Selous	Photographic	800	2010	4	9	Brink 2010	Stable
4.	Rungwa GR	Hunting	9000	2012	1	6	Caso (2012)	Unknown
5.	Luganzo GCA	Hunting	2500	2012	1	5	Caso (2012)	Unknown
6.	Tarangire	Hunting	5386	2015	2	1.3	Ikanda et al (Inprep)	Unknown
7.	Moyowosi GR	Hunting	12.432	2007	2	3.3		Unknown
8.	Tarangire NP	Photographic	2800	2015	continuous	7.5	Laiser et al (2014)	Decrease
9.	Ngorongoro	Photographic	250	2014	continuous	22		Stable
10.	Serengeti NP	Photographic	14.763	2014	continuous	12.5		Stable
11.	Katavi NP	Photographic	4279	2005	1	4	Kiffner,2009	Unknown
12.	Lake Manyara NP	Photographic	132	2006	4	20	Ikanda & Kissui per comm	Stable
13.	Enduimet WMA	Photographic	751	2013	2	20	Kissui pers comm	Stable

Over the 516,900 km² of permanent lion presence range, 304,400 km², i.e. 61%, lie within protected areas gazetted as hunting areas, and 57,838 km², i.e. 11.4%, lie within National Parks (Mésochina et al. 2010).

Most lions are found in Protected Areas, with a population size estimated to be around 13,600 (i.e. 81.1%), and around 3,200 individuals in non-gazetted areas (i.e. 18.9%) (Ikanda and Packer 2006; Mésochina et al. 2010).

Of the estimated 13,600 lions in the Protected Areas in 2010, ca. 21.5% are in National Parks, and ca. 56.8% in hunting areas. (see Table VII in Mésochina et al. 2010).The remainder 21.7% are found in protected areas other than National Parks, which are not open for safari hunting, e.g., Forest Reserves etc.

Therefore, the protection of lion habitat and range in Tanzania largely relies on the existence of these areas gazetted as safari hunting areas.

As illustrated in Table 1 the vast majority of lion surveys in Tanzania have taken place in some of the main National Parks, and only sporadically outside these Parks, i.e. in other gazetted areas or in not gazetted areas (but see Mésochina et al. 2010). Consequently, population trends are so far only available for few populations in some National Parks (Bauer

et al. 2015). Therefore, updated information on population size, and on trends, is lacking for most lion populations in Tanzania.

Only in Serengeti NP, Ngorongoro CA, Tarangire NP, and Selous photographic sector (Matambwe) to a lesser extent, there were enough census surveys to reliably assess trends, i.e. with no doubtful interpolation.

Contrary to Bauer et al. (IUCN 2015) results for Matambwe (Selous photographic sector), lion numbers remained stable between 1993 and 2014 in that area.

Bauer et al. (IUCN 2015) selected sites for their assessment with: "The minimum number of census surveys per site over the assessment time period is two". Therefore, they should also have considered sites such as Selous (hunting management part) and Moyowosi GR where 3 and 2 census surveys respectively were carried out between 1993 and 2014.

Bauer et al. (IUCN 2015) kept Katavi National Park (KNP) in their sample, and they put the lion population in KNP at 0(zero), whereas only one census survey was carried out there, the one made by Kiffner et al. (2009) that estimated the adult lion population in KNP at 168 (CL 77-439) individuals in 2005.

Because there was no starting point, the analysis for Katavi could have been performed without doubtful interpolations based on guesstimates or extrapolations (Riggio et al. 2016; Tim Caro *in litt.* 2015). This contradicts what Bauer et al. (2015) wrote: "We did not include population estimates for sites which were based on extrapolation of Lion densities obtained by research in other areas, or informed guesstimates by researchers". And Professor Tim Caro who has worked in Katavi for years, publicly said: "It's simply not true that there are no lions in Katavi. If you go to the park now, you're going to see them around the tourist circuit." <http://www.sciencemag.org/news/2015/10/east-west-africa-could-lose-50-their-lions-2035>

Such as for Katavi, one census survey has been carried out in Rungwa Game Reserve and Luganzo Game Controlled Area between 1993 and 2014, but Bauer et al. (2015) did not considered these two areas.

Based on these and other data, Tanzania has sent a letter to IUCN including a rebuttal of their Red List assessment for lion (Annex 1).

The Wildlife Division and TAWIRI have made it a priority to develop better trend data. The WD and TAWIRI launched a national large carnivores survey in 2014, with the objective to monitor the status and population trends of lion, and other large carnivores, in the safari hunting areas of Tanzania. The Wildlife Division is committed to improving the quality of data on Tanzania's lion population.

4. Legislation and Enforcement

Wildlife species in Tanzania, including African lions, are protected by law under the Wildlife Conservation Act No.5 of 2009, and its subsidiary legislations. The Act ensures there is suitable habitat in terms of space and provides for protection of plant species which is source of food for prey species of the African lion. Such habitat and food resources are also protected by other legislation such as the Tanzania National Parks Act (CAP 284 R.E. 2002), implemented and enforced by TANAPA and the Ngorongoro Conservation Area Act (CAP 282 R.E. 2002) implemented and enforced by the Ngorongoro Conservation Area Authority (NCAA).

Wildlife hunting in Tanzania occurs under the natural heritage of resident hunting and safari hunting. The safari hunting sector in Tanzania is governed by the Wildlife Conservation Act, No. 5 of 2009, the Wildlife Conservation (Tourist Hunting) Regulations of 2010 (now 2015) and the Wildlife Conservation (CITES Implementation) Regulations of 2005. The hunting season starts from 1st July to 31st December as per Closed Season Order of 2012.

Tanzania hosts the world's largest lion population and this is by virtue of regulatory mechanisms in place that guides and ensures the species conservation (Wildlife Conservation Act No.5 of 2009), and sustainable utilization as a national resource Wildlife Conservation (Tourist Hunting) Regulation, 2010 (now 2015). The Wildlife Act ensures that the species natural habitat is preserved alongside available prey species. Primarily, this is through a network of protected areas that conform to IUCN categories of protected areas. Secondary, the Act ensures that the species is protected by law even where it occurs beyond protected area boundaries.

4.1 Stakeholders in the conservation of lion.

The Wildlife Division of the Ministry of Natural Resources and Tourism (MNRT) manages safari hunting in Tanzania. It is headed by Director of Wildlife and Assistant Directors responsible for Utilization, Law Enforcement, Development and Training. In Law Enforcement, there are zonal anti-poaching offices headed by zonal anti-poaching Commanders. There are eight anti-poaching zones, namely Arusha, Dar es Salaam, Songea, Tabora, Manyoni, Mwanza, Iringa and Bunda (Figure 1).

The Wildlife Division operates the Tanzania Wildlife Protection Fund (TWPF) which has the objective of facilitating and supporting wildlife conservation, inside and outside protected areas particularly in: anti-poaching operations and law enforcement; operations of the Wildlife Protection Unit; the conservation of wildlife; education, training and awareness creation in wildlife matters; capacity building in wildlife management; wildlife management research and any other activity related to conservation of wildlife.

Local Government Authorities (LGAs), that is District Councils (DC), are responsible for the implementation of wildlife policy within their jurisdictions by formulating and enforcing laws, and preparing sound physical and development plans that protects wildlife and habitat.

Wildlife Management Areas (WMA) represent the community based conservation system of Tanzania and they are seen as a key component of rural development and as one of the best weapons in the fight against illegal utilization. Safari hunting is an important component of WMAs' activities and revenues.

Hunting companies are responsible for supporting the government in the conservation, development and sustainable utilization of wildlife resources through investing in the wildlife sector. According to the Wildlife Conservation Act No. 5 of 2009, hunting companies are required to record and report relevant details of all animals killed, wounded, or captured.

The role of local and international NGOs is to support the government financially and technically in conservation, management and development of wildlife and ecosystem resources. In particular, the role of NGOs is to provide conservation education to the public, financial assistance to research projects and assistance to WMAs in wildlife management.

The following scientific research and conservation projects are beneficiaries of the above arrangements:

- African People and Wildlife Fund- <http://afrpw.org/initiatives/wildlife-conservation/maasailand-lion-conservation/>
- Ruaha Carnivore Project – www.ruahacarnivoreproject.com
- Serengeti Lion Project – www.lionresearch.org
- http://sybawildlifeconservation.org/alliance_projects/maasai_steppe_lion_conservation_alliance_project_-_mslcap_swc-tz
- The School For Field Studies - <http://www.fieldstudies.org/about/research/tanzania>

In order to insure that there is inter-agency cooperation in the protection of wildlife resources, the Wildlife Division is working with TANAPA, TAWIRI, NCAA, Police, TISS and Airport Authorities.

5. Safari Hunting in Tanzania

Safari hunting in Tanzania is consistent with a tourism policy of high quality products and low volume tourism and offers a unique experience due to the following reasons:

- Large wilderness hunting areas that assure high appreciation of client experience during hunting;
- Variety of trophy animal species, which are key in the safari hunting sector. These include: Leopard, Lion, Sitatunga, Puku, Gerenuk, Oryx, Greater and Lesser Kudu, Sable Antelope, Buffalo, Crocodile and the Elephant.

Safari hunting is conducted in areas known as hunting blocks designated in Game Reserves (GRs), Game Controlled Areas (GCAs), Open Areas (OAs), Forest Reserves (FRs) and Wildlife Management Areas (WMAs) (Figure 1).

In the current Tourist Hunting Regulations (2015), hunting blocks in Tanzania are classified into five categories based on criteria that include species diversity, the block being within/adjacent to a Game Reserve, bordering National Parks or Ngorongoro Conservation Area, habitat diversity, availability of water for wildlife, human activities, diversity of huntable species and infrastructure.

Hunting companies are allocated hunting blocks for tenure of five years' subject to annual review of the company's performance. The process of allocating hunting blocks for the 2013 to 2018 was concluded in 2011.

The Wildlife Division is evaluating the feasibility to increase the tenure of hunting blocks to ten years as long tenure can enhance sustainability by securing investments.

As prescribed by the Tourist Hunting Regulation, 2015, by 31st December of the third year of the hunting term, companies intending to renew the tenure of ownership of the hunting block must submit their applications to the Ministry, in the form of Performance Reports containing information on several criteria:

- the applicant has been utilizing the hunting block allocated to him and scores at least forty percent of the value of the key animals as specified in the Fourth Schedule to of the Regulations per hunting season;
- the level of revenue collected from photographic tourism depending on the category of the hunting block;
- whether the applicant has been contributing to the villages within and adjacent to his hunting block an amount of not less than USD 5,000.00 for each hunting block annually as a contribution to the implementation of various community development projects;
- the level of the applicant's contribution to the improvement of infrastructure and protection of the environment within his hunting block;
- the level of the applicant's contribution towards anti-poaching operations or defending against any other bad intentioned persons in issues of conservation of wildlife; and
- the applicant's record regarding the export of trophies to relevant clients.

Hunting Blocks are renewed after evaluation by the Hunting Block Advisory Committee established under section 38 of the Wildlife Conservation Act of 2009.

The Performance Reports for this term of Hunting Blocks (2013-2018) were received by 31 December 2015 and contain a wealth of information demonstrating the enormous contribution of hunting to habitat and wildlife conservation and to rural communities' livelihoods.

They are in the process of being forwarded to the Hunting Block Advisory Committee for evaluation.

Hunting Blocks are managed under the quota system whereby each block is assigned with a specific number per species to be hunted in a given season after advice from the Quota Allocation Committee (See section 6.1).

Costs of management of Hunting Blocks are extremely high. A realistic estimate of costs of management incurred by hunting companies on a yearly basis ranges from 300,000 to 500,000 USD for each block. These costs are block specific and includes a variety of costs such as fuel, graders, camps, salaries, anti-poaching, cars, lorries etc. Lease agreements in Tanzania require assistance with anti-poaching from hunting operators in Hunting Blocks.

Safari hunting has created financial incentives for the development and/or retention of wildlife as a land use across an area of 304,400 km² in Tanzania, outside National Parks and NCAA, where Safari hunting is the primary land use as game reserves, or where trophy hunting is a key component of community conservation schemes. This is a system to conserve biodiversity in areas outside strictly protected areas where hunting is prohibited.

Safari hunting is viable in remote parts of the country that are not popular among photo-tourists (e.g. southern Tanzania). Hunting is able to generate revenues under a wider range of scenarios than photo tourism, including remote areas lacking infrastructure, attractive scenery, or high densities of viewable wildlife. Tourist hunting revenues are vital in part because there are not enough tourists to generate income for all protected areas. Even in the most visited countries such as Tanzania, photo tourism revenues are typically sufficient to cover the costs of only some of the parks and certainly not to justify wildlife as a land use outside of strictly protected national parks.

In Tanzania, for the past 6 years, revenues generated by hunting were 3 to 8 times greater than those generated by photographic tourism in areas managed by the Wildlife Division (Table 14 section 11). Hunting revenues can be generated with lower environmental impacts from fossil fuel use and habitat conversion for infrastructure development (among others see Di Minin et al. 2016).

The most important factor to be considered is that habitat and ecosystems conservation is the final objective in the conservation policy of Tanzania.

Safari Hunting is an important tool to maintain biodiversity i.e. a variety of ecosystems and species across Tanzania. Rapid human expansion and conversion of land to agriculture or livestock ranching and illegal activities can be controlled and limited through the value given to wildlife, the presence of hunting operators and the willingness of local communities to collaborate due to the returns they obtain from safari hunting, including protein, which is not generally available from photo tourism.

Research on the impact of hunting on biodiversity has shown that hunting (and its associated management) can be a strong driver in conserving biodiversity, because many of the objectives in hunting (maintaining healthy populations, preserving natural habitats, reducing limiting factors for game) are shared with those of wildlife management and conservation at large. (Fischer et al. 2013).

Financial resources for conservation, particularly in developing countries such as Tanzania, are limited. As such, consumptive (including Safari hunting) and non-consumptive (including photo tourism safaris) uses are both needed to generate funding. Without these, many natural habitats would otherwise be converted into agricultural or pastoral uses. Safari hunting can also have a smaller carbon and infrastructure footprint than ecotourism, and it generates higher revenue from a lower number of uses.

Wild areas of Tanzania provide biodiversity services, i.e. ecosystem services, through the provision of recreational opportunities such as hunting and the aesthetic enjoyment of the wildlife that utilize these landscapes.

Safari hunting plays an important role in the ecosystem services as defined in the Millennium Ecosystem Assessment (MA) (2005), i.e. "the benefits people obtain from ecosystems."

Safari Hunting is both a provisioning and cultural service (two of the four categories) of services identified by the MA.

The Safari hunting system in Tanzania where operators pay fees and other payments to encourage ecosystem and species conservation, and rural livelihoods, could be considered as a Payment for Ecosystem Services (PES). Its contribution in this regard and in the whole framework of Ecosystem Services shall be analyzed further and it is the intention of the Wildlife Division to start working on this subject as a priority.

5.1 Lion hunting in Tanzania

The lion is generally protected from all forms of consumptive use in Tanzania, with the exception of Safari hunting. Safari hunting is highly conservative and strictly controlled and thus does not constitute to the overutilization of the population (Table 5 and Figures 8, 9 and 10).

Safari hunting is an integral part of Tanzania's Lion and Leopard Conservation Action Plan (see section 8.1) because of its role in generating conservation revenue for national authorities and local communities, and its contributions to anti-poaching and habitat preservation. It must be noted that revenues generated from hunting are crucial to maintain the Wildlife Management Areas and are contributing to poverty reduction and socio-economic development.

The safari hunting sector's sustainability would be threatened by the loss of its main attracting product (the lion) combined with the loss of its main markets (the USA and EU). A lot of hunting companies operating will return most (if not all) of their hunting areas to the Wildlife Division to avoid bankruptcy. As a consequence, many protected areas devoted to safari hunting will be converted to agro-pastoral land, leading to the unavoidable extinction of wildlife and natural habitats and the collapse of ecosystem services. This will lead to an ecological disaster in Tanzania.

Hunting practices are managed under the best available science, which offers guidance/regulates quotas and target animal selection (see sections 5, 6 and 7).

5.2 Hunting Regulations of 2015 and their enforcement

The Wildlife Conservation (Tourist Hunting) Regulations, 2010 have been revoked and substituted by the Wildlife Conservation (Tourist Hunting) Regulations, 2015, published on 18th September 2015 in the Supplement No. 34 of the Subsidiary Legislation under Government Notice No. 414. (ANNEX 2). These regulations include five parts: (1) Preliminary Procedure for Application and Allocation of a Hunting Block, (2) Condition and Restrictions Relating to a Hunting Block, (3) Management and Supervision of Professional Hunters and (4) Miscellaneous provisions such as control of hunting quotas, offences and penalties, etc., Offence in Contravention of Standards Set, Offence for Hunting (which includes age restriction limit for lion hunting and related penalties) and (5) General Penalty.

The revision of regulations to address new issues is an important part of Tanzania's adaptive management process for safari hunting as recommended by scientists (e.g. WWF 1997; Whitman et al. 2004; Lindsey et al. 2012).

Huntible 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 implemented the following:

- Include an age-based rule into the hunting Regulations;
- Strengthen the existing monitoring procedures for lion safari hunting;

- Develop capacity building within the safari hunting sector.

Within all the African lion range states, Tanzania has been the first country to officially establish age restriction rules on lion hunting at country level. It was clearly stipulated in sections 24(5)(a) and 24(6) of the Tourist Hunting Regulations of 2010 (now superseded by section 27 (1) of the Tourist Hunting Regulations of 2015) 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 his or her professional hunters’ license.

The Wildlife Division, Ministry of Natural Resources and Tourism, has since (i) published a legal guidance document enforcing the 2010 Regulations, (ii) gradually improved the monitoring and control mechanisms of lion safari hunting (see section 6.2) and (iii) continuously raised the professionalism of the hunting sector. These achievements place Tanzania well ahead of any other lion range state in terms of lion safari hunting monitoring, control and penalization of offenders.

These Regulations had as immediate effect to significantly reduce lion harvest and increase the average age of the lions harvested (see sections 6 and 7).

Since their entry into force, the enforcement of the 2010 Regulations has been developed through a participatory process involving representatives of the 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 a lion’s age cannot be assessed without uncertainty (e.g. Whitman and Packer 2007; Ferreira and 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*”.

Following the guidance document referred above, the Wildlife Division has consequently adopted a system for adjusting the lion quota based on the age of previously harvested trophies (Figure 4) which includes:

- Accepted (6 years-old and above);
- Accepted with penalties (4 and 5 years-old);
- Not accepted with deterrent penalties (under 4 years-old).
- The age categories of lion trophies that can be exported: only trophies assessed to be at least 4 years-old are allowed for export;
- An aged-based lion quota-setting system: 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 decreased by 1 for each lion harvested with an age of 4 and 5 years;

The quota is decreased by 2 for each lion harvested with an age under 4 years. In addition, any professional hunter who guided a client to hunt lions under 6 years old commits an offence and is liable on conviction:

- To a fine of US Dollars one thousand or imprisonment for a period not less than six months for the first time of commission of an offence;
- To a fine of US Dollars four thousand or imprisonment for a period not less than one year for the second time of commission of an offence; and
- To a fine of US Dollars ten thousand or imprisonment for a period not less than one year and a cancellation of the Professional Hunters’ license for the third time of commission of an offence.

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

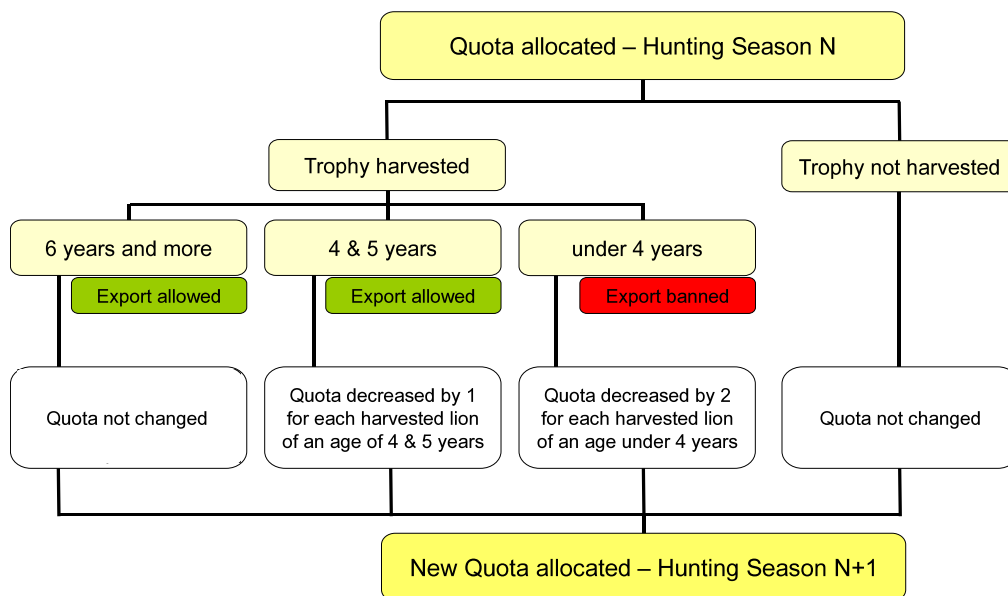


Figure 4: The Wildlife Division System for adjusting the lion quota based on the age of previously harvested trophies.

5.3 Capacity-building of the hunting sector

Before the onset of the 2012 hunting season, the hunting sector was informed of the new rules for enforcing the 2010 Regulations regarding lion 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 organization of training sessions.

Capacity-building of the hunting sector is a continuous activity and there are plans to have workshops, preferentially prior to the hunting season, with hunting operators, professional hunters and Wildlife Division officers.

5.4 Involvement of the hunting sector in Lion Conservation

The mechanisms for monitoring and controlling lion hunting are well accepted by the hunting sector in Tanzania.

Representatives of the hunting sector were involved in the elaboration process of the Amendment of the 2010 Regulations. The Wildlife Division regularly explained the context and the rationale of that Amendment to the sector.

As a result, the hunting sector is well committed to fulfill their duties in regards to lion hunting monitoring and control.

Since 2011, every single lion harvested by hunters in Tanzania has been inspected by the Wildlife Division (i.e. 100%).

Safari operators have contributed and are contributing substantially to Tanzania's enhanced anti-poaching efforts and communities' development. They provide funding, equipment and the technical expertise for repairs, transportation, and most critically, funding for government game scouts as well as their own anti-poaching patrols.

Hunting Companies' anti-poaching teams acting in collaboration with the Wildlife Division Anti-Poaching Units, remove snares, prevent illegal logging, and arrest poachers in a coordinated and continuous effort.

This effort is also pointed toward assistance to rural communities in order to improve their livelihoods. Apart from the annual 5,000 USD contribution which is mandatory under the Tourist Hunting Regulations, the Safari Operators made enormous voluntary contributions aimed at health care, water provision, infrastructure developments for rural communities.(See also section 10)

These contributions amount to more than US\$ 5,5 million for the triennium 2013-2015.

Table 2 below illustrate the contribution of Safari Hunting Operators from 2013-2015 and is compiled from information taken from the Operators Performance Reports referred in section 5.

Table 2 Contribution of 45 Safari Hunting Operators for Antipoaching, Block development and community development 2013-2015 (in USD).

Anti-poaching (USD)	Block Development (USD)	Community Development (USD)	TOTAL
1.871.894,00	1.930.112,49	1.776.699,67	5.578.706,16

These contributions include but are not limited to:

- Support of mobile antipoaching teams in collaboration with respective Game Reserve/District Council;
- Provision of graders for maintenances of existing roads;
- Acquisition or deployment of aircrafts/helicopters for aerial patrols, maintenance or development of airstrips, pilot training;
- Donation of 4x4 cars and motorcycles, deployment of boats for antipoaching;
- Donation and installation of radio equipment for communication;
- Donation of GPS devices and satellite mobile phones;
- Donation of firearms and ammunitions for antipoaching teams;
- Donation/building of class rooms/schools for rural communities, donation of stationery for schools;
- Donation/building of boreholes and water tanks for rural communities;
- Support health programs for rural communities.

5.5 Transparency

As recognized since the preparation and implementation of the Carnivore Action Plan of Tanzania (2009), transparency is essential for lion conservation. Tanzania maintains transparency through hunt return forms and requiring a government ranger participate in hunts, which make each hunt visible to the WD. Also, the WD requires annual reports from hunting operators, which allows for oversight of offtakes and understanding of benefits

sharing and anti-poaching. The MNRT and WD are overseen by the rest of the government through audits. And Tanzania's wildlife management is transparent to the rest of the world through presentations to the international community on a number of occasions:

- 10th Annual African Wildlife Consultative Forum, 10-12th October 2011, Manzini, 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;
- 19th Session of the African Forestry and Wildlife Commission of FAO (United Nations Food and Agricultural Organization), 30th September-4th October 2013, Windhoek, Namibia;
- 12th annual meeting of the AWCF (African Forum of Consultation on Wildlife), 3rd-8th November 2013, Livingstone, Zambia;
- Annual General Assembly of the CIC (International Council for Game and Wildlife Conservation), 23rd-26th April 2014, Milano, Italy;
- Annual General Assembly of the AGGC (Association des Guides de Grande Chasse, Professional Hunters' Association), 10th June 2014, Paris, France;
- Game Fair, 13-15th June 2014, Chambord, France.

The USFWS acknowledged on page 80042 of the ESA Final Rule on lion (USFWS 2015) that Tanzania has implemented age restrictions and shown reductions in offtake; however, it reported that transparency (in terms of trophy quality data) and the scientific objectivity of the evaluating body has been questioned. We are puzzled and severely concerned by this unreferenced statement because of the various measures described above. Concerning independency of science this is open to debate knowing that lion scientists are financed from several sources including animal rights groups.

Questionably, and in contrast with the above page of the USFWS ESA Final Rule (USFWS 2015), on page 80024 it is stated: *"Unless reforms are made to the current management of trophy hunting, we expect the declines specifically documented from excessive offtakes in Benin, Cameroon, Tanzania, Zambia, and Zimbabwe to continue. Furthermore, we expect excessive harvests to further contribute to declines in the species across its African range."* This statement is simply untrue for Tanzania. The offtakes are not excessive.

Further, Tanzania's records of its implementation of the age restriction system are open to scrutiny to the international scientific community. Tanzania has requested several times to have independent scientists evaluate its system. Peer reviewers have done so. Tanzania has been and will continue to be open to such checks upon its process.

We are also puzzled by general allegations concerning corruption as reported in the USFWS ESA Final Rule (USFWS 2015).

The Government of Tanzania has taken important steps to address corruption with the support of the international community. Specifically, on hunting, several actions were taken against companies that infringed Laws and Regulations. Such general, unsubstantiated allegations are not helping our relationships. If the USFWS has precise, substantiated information on corruption in hunting practices in Tanzania, we urge the USFWS to provide the Government of Tanzania with facts and evidence in order that our enforcement and judicial system can act accordingly.

We are also requesting USFWS to provide to the Wildlife Division the source material of your statement on page 80017 of the USFWS ESA Final Rule on Lion(USFWS 2015):" *Although we acknowledge the steps many countries have taken to address local community incentives,*

most of the countries are currently not transparent about the benefits provided to local communities, and due to the high revenue potential, are subject to corruption (Packer 2015, pers. comm.) as it is highly defamatory.

6. Lion hunting quotas and monitoring

6.1 Hunting quotas

The hunting quotas are based on data and other relevant information available in terms of the following criteria: species distribution, natural breeding history, recruitment rate and population estimates, which partly derived from regularly conducted censuses (large mammals), research work and indices as may be reflected in various reports by field personnel, through specific data forms. In essence, all species that are hunted every year must be included in the annual quotas that are determined by the Quota Allocation Advisory Committee comprised of wildlife conservation experts from TAWIRI, the University of Dar es Salaam, Sokoine University of Agriculture, University of Dodoma, the College of African Wildlife Management and the Wildlife Division (which is the CITES Management Authority). The Committee receive inputs on the wildlife situation from various stakeholders and meet once a year and minutes of the meetings are kept for reference, although in Swahili only.

The Wildlife Division monitors harvesting of lions through its quota system. Hunting companies are obliged to show the number of lions they shoot each hunting seasons through hunting returns, these numbers are verified by records from local wildlife officials (Park managers and District Game Officers) who supervise all hunting. This system also enables the monitoring for quality of trophies using the age restriction system which is implemented. Offtakes are monitored through hunt return forms and the participation of government scouts. The system also includes, as explained in section 4.2, a reduction on the quota as a penalty for under-aged lions shot in a given block.

Furthermore, harvesting is also monitored through a CITES trophy export permit system; as lions are harvested for trophy by foreign tourist hunters that must export them. As Lion is a CITES listed species, it can be expected that a high level of international scrutiny will be applied to international trade in the species.

The Wildlife Division utilizes many years of cumulative experience in setting quotas that relies on several verifiable quantitative and qualitative indicators (mainly population estimates and trophy quality and off take levels etc.) that can demonstrate little or non-significant detrimental impacts on the populations.

Further to the discussion in section 2, lion surveys are conducted in several areas although a precise lion inventory is a difficult and sometimes impractical task. Therefore, Tanzania relies on the recommendation of establishing the quotas based on scientific recommended thresholds complemented by the lion aging system.

Until this year, Tanzania maintained a quota of 315 lions as sport-hunting trophies, with the age restrictions as a secondary quota. That number was in line the recommendation of 1 lion/2000Km² for most hunting areas, and 1 lion/1000Km² for the Selous Game Reserve, given that the lion range in Tanzania of 516,900 km² of permanent presence and 232,800 km² of temporary presence. This quota was maintained because it was in line with available science and not detrimental to the survival of the species. However, the utilization of this quota was low, almost never above or even at 50% (see Table 5).

Following consultations with the Scientific Authority (TAWIRI), the CITES Management Authority (WD) has decided to introduce a new export quota for lion hunting trophies of 207 specimens. This will be effective at the start of the next hunting season, commencing in 1st July 2016, and an official instruction has been signed by the Director of Wildlife.

This new quota is (i) a reduction of one third of the previous quota and (ii) 25% below the sustainable harvest level suggested by the CITES Scientific Authority (TAWIRI) and Packer et al. (2011), i.e. 1 lion/2000Km² for most hunting areas, and 1 lion/1000Km² for the Selous Game Reserve and other high density areas, and taking into account the lion range in Tanzania (permanent presence range for lion of 516,900 km², and a temporary presence range of 232,800 km²).

The new quota is a further precautionary measure, complementing the strict age restriction regulation implemented since the entry into force of the Tourist Hunting Regulations of 2010. It is a three tier limit, i.e., age, number per square kilometer, and maximum overall number. It made sense to the Management Authority to reduce the quota because the prior quota was never utilized fully, and the low level of offtake in recent years demonstrates Tanzania's commitment to sustainable hunting. (Annex 7).

Therefore, we do not concur with the analysis provided on page 80021 of the USFWS ESA Final Rule (USFWS 2015):

Other range countries continue to have fixed quotas in place and charge a percentage of the quota regardless of success (CAR charges 50 percent; Namibia 100 percent; Tanzania 40 percent; Zambia 60 percent; Zimbabwe 30 percent). This approach facilitates harvesting of trophies even if a sufficiently old lion is not found (Hunter et al. 2013, p. 6). Therefore, harvested lions are often of lower quality, younger, and less desirable male lions, as operators and hunters, who had already paid the trophy fee, had no incentive to be selective. Abolishing fixed-quota fees and only allowing optional quotas will encourage and reward operators who are selective and follow age restrictions (Lindsey et al. 2013a, p. 9; Packer et al. 2006, pp. 5, 9).

In fact, the mandatory payments for key animals required from operators and monitored during the three years' term of Block renewal, are based on the value of the key animals (at least 40% of the value) as stipulated in section 16.5 of Tourist Hunting Regulation 2015 and calculated in accordance with the Fourth Schedule of the same Regulation. It does not mean that the quota is fixed but it is an indicator of hunting performance and wildlife abundance in the assigned hunting block.

The administrative and management system of hunting in Tanzania is complex and this complexity need to be understood before criticizing it.

Tanzania firmly emphasizes that, well before this new significant reduction of hunting quotas, the age restriction provision had already succeeded to decrease offtakes and to maintain them way below the sustainable threshold levels. Indeed, since the implementation of the Tourist Hunting Regulations of 2010 and the adoption of the 5/6-years of age provision to harvest lion an impressive number of very positive results have already been obtained:

- Offtake has been reduced to about 40 lions per year;
- Offtake levels, both at national and regional scales, have been kept way below the sustainable harvest rates suggested by Packer et al. (2011); and
- The average age of the harvested lions has increased, with a proportion of lions above 6 years' old that is ten (10) times higher in 2014 than in 2011.

By implementing the peer-reviewed (independent experts are conducting the lion aging review) age restriction provision six years ago, Tanzania in fact already set up a mechanism that is far stricter than the suggested sustainable offtake threshold levels. Had Tanzania simply followed these suggested thresholds, offtakes would have most probably remained three to four times higher than they have been in the past five years, i.e. at levels prior to the 2010 Hunting Regulations (see Table 5).

In addition to the continued assessment and monitoring of human-lion conflicts and habitat loss outside protected areas, which are unanimously recognized as the two main threats to lion conservation (IUCN, 2006a, b), Tanzania is committed to keep on (i) monitoring lion

hunting and (ii) assessing the impact of the Tourist Hunting Regulations of 2010 (amended 2015) on the sustainability of lion hunting.

The pressure and impact of hunting are monitored through measures of hunting statistics such as harvest rates, catch rates, age of harvested males, and estimates population size and structure.

6.2 Mechanisms for monitoring lion hunting in Tanzania and mechanisms for controlling the age of trophies

The monitoring of the lion hunting (Figure 5) is carried out through the implementation of a specific database and a specific safari return form (Figure 6). Based on all hunting permits issued by (and compulsorily returned to) the Wildlife Division, a specific database has been set up to record lion hunting harvests. Regularly updated, the database is used to follow-up lion Safari hunting activity and trophy skulls that must be presented to the Wildlife Division for inspection.

Since mid-August 2011, 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 Safari 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 forms and trophy photographs are compulsorily provided by the hunting companies to the Wildlife Division. No CITES export permit can be issued without compliance.

In 2011, a temporary lion hunting database was set up for registering data on lion safari hunting including hunting permits. This database, built from hunting permits and safari return forms, hosted data such as how many lions have been hunted, by which hunting operator, which professional hunter, in which hunting area, for how many hunting days, etc. Such information allowed following-up not only lion safari hunting activity (e.g. hunting effort, hunting success), but also lion trophies submitted by the hunting operators.

Starting in 2012 the Ministry of Natural Resources and Tourism introduced an electronic permitting system for Safari hunting and Photographic Tourism activities in order to increase efficiency, transparency and revenue collection.

The objective of this system was to intensify revenue and data collection, control quota utilization and increase efficiency in issuing hunting permits. Since the system became operational the Ministry has reduced time previously spent in processing hunting permits, collection of revenue and assessment of quota utilization by company.

Hunting companies are required to complete Safari hunting permit application forms. This form requests company information, client particulars, Hunting Safari particulars, list of observers and animals to be hunted. Hunting companies can complete electronically at their office or hard copy and submit at the Hunting offices in Dar or Arusha. After completion of the form, invoices are issued to the company based on the package and number of observers if any. Currently there are 5, 7, 10, 16, 21 and 28 day safaris. After payment of the hunting permit at the account department, accountants confirm the payment online to allow for issuance of hunting permits at the Safari hunting Section.

Hunting companies present a proof of permit payment at the Safari hunting Section and collect hunting permits. However, If the company has pending dues, the system blocks all services until all unpaid invoices are cleared.

After the expiration of hunting package as indicated in the hunting permit, hunting companies are required to submit all hunting permits and pay all government dues within 42 days. Information about the number of wildlife species hunted, areas where hunted, caliber of firearm used, time and block where the game was hunted are recorded in the system.

Invoices are created based on the number of game shot. In case of over use of the quota companies are penalized direct from the system.

The system deducts the number of animal hunted from the quota uploaded in the system. The system indicates the quota balance from each animal species. In this regard, over utilization of the hunting quota issued to a company is controlled.

The system is password protected and the user numbers are restricted within the Ministry and they need their own internal account which is monitored by an administrator of the IT section of the Ministry. The Hunting Companies and Photographic companies can log into to the system to submit their applications. The system can generate daily, weekly, monthly and annual reports and several queries can be made.

6.3 Aging System

Concerning the aging system, we are pleased that USFWS recognized that our lion aging system has decreased legal offtakes. We are puzzled by the transparency remarks raised by USFWS in their Final Rule and we addressed them in section 5.5.

In 2015 stakeholders from the hunting sector were invited to witness the lion aging sessions. In the near future the Tanzania Wildlife Division is going to call more independent reviewers to evaluate its lion aging system.

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 and Packer 2007; Ferreira and Funston 2010; White 2010; Niassa Lion Project). However, the research is on-going for a more objective method, so the Wildlife Division carefully monitors scientific developments likely to improve the age diagnosis of lion trophies. To this end, the Wildlife Division launched in October 2012 a field study to measure various criteria in known age wild lions in collaboration with the Tanzanian Wildlife Research Institute. The results are shown in section 6.3.4.

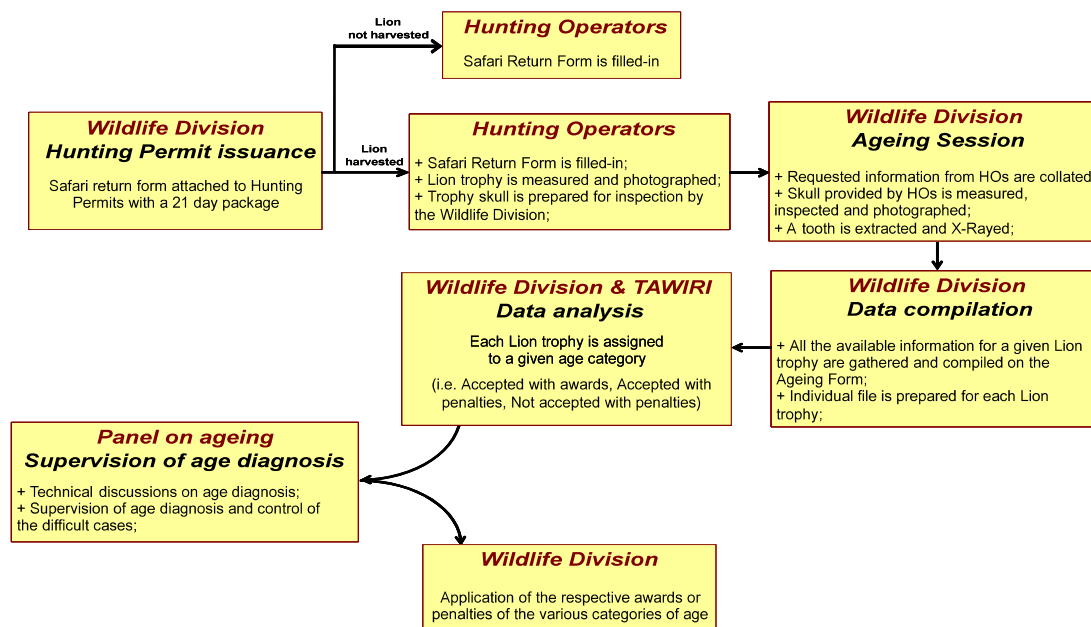


Figure 5: The Wildlife Division mechanism for monitoring and controlling the lion safari hunting in Tanzania (HOs: stand for hunting operators).



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

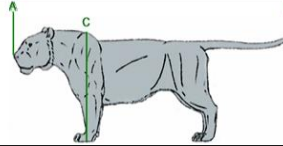
REMARKS:

... See next page

Figure 6: Lion Safari Return Form Part I (Part II 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!

6.3.1 Inspection of lion trophies

The control of the harvested lion trophies is conducted during ageing sessions where hunting operators are requested to bring the skulls of their lion trophies for inspection at the Wildlife Division. This step is compulsory for the issuance of a CITES export permit.

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.
- The detailed qualitative inspection of the skull. Each tooth is carefully inspected in regards to its integrity and erosion; additively the integrity and sharpness of the enamel ridges of the canines are assessed, as well as grooves 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 and 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 and Packer 2007). The pulp cavity fills as individuals age. 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 and Packer 2007).

All the information recorded during ageing sessions is collated in a specific synthetic ageing form (Figure 7).



Lion Hunting Monitoring Programme in Tanzania - Trophy Ageing Form -



Code Number: Inspection Date:

Photographs and measurements taken by professional hunters							scoring					
							-	-/+	+			
Body	Total length (body+tail, cm)						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Shoulder height (cm)						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Mane	Head		Between ears			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	Shoulder		Behind ears			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	Throat		Chest			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
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							-	-/+	+			
Skull	Total length (cm)			Height (cm)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Total width (biorbital breadth, cm)			Nasal suture length (cm)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Least interorbital breadth (cm)			Weight (kg)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Suture			Interfrontal:			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Teeth	Integrity		Intact	Cracked	Chipped	Broken	Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<i>Canines</i>	<i>Upper</i>	<i>UR</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<i>Lower</i>	<i>LR</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Incisors</i>	<i>Upper</i>	<i>UR1-3</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<i>Lower</i>	<i>LR1-3</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Premolars</i>	<i>Upper</i>	<i>UR2-4</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<i>Lower</i>	<i>LR3-4</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Erosion		Minor	Mild	Medium	Deep	Very Deep	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<i>Canines</i>	<i>Upper</i>	<i>UR</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<i>Lower</i>	<i>LR</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Incisors</i>	<i>Upper</i>	<i>UR1-3</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<i>Lower</i>	<i>LR1-3</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Premolars</i>	<i>Upper</i>	<i>UR2-4</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<i>Lower</i>	<i>LR3-4</i>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Molars</i>	<i>Lower</i>	<i>LR1</i>						<input type="checkbox"/>	<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"/>	<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"/>			
Canines	Ridges	Side	Jaw	Integrity		Sharpness		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
				Left	Right	Left	Right	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Back	Upper							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			Lower							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Internal	Upper							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Lower							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Gum recession (cm)			UCL:	UCR:	LCL:	LCR:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Length (cm)			UCL:	UCR:	LCL:	LCR:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Grooves			LCL:	LCR:			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PW2 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"/>	<input type="checkbox"/>	
Clearly unacceptable		<input type="checkbox"/>	Tolerated		<input type="checkbox"/>	Clearly acceptable		<input type="checkbox"/>	<input type="checkbox"/>			
							# -	# -/+	# +			
Remarks:												

Figure 7: Ageing Form.

6.3.2 Analysis of collated information

Together with the information recorded during the ageing sessions, the measurements of the lion harvested (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 and Funston 2010).

Photographs of the lion harvested taken by the professional hunter are used to diagnose 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 and Packer 2007; White 2010; Niassa Lion Project).

A scoring mechanism is then applied to each criterion, resulting in a global score used to assign the harvested lion to an age category (Figure 7).

6.3.3 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 hunting season and were asked to age them.

The Wildlife Division invited three renowned lion experts 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 diagnose the age of the trophies. Three experts gave the feedback of the blind test at the time by 15/12/2012, resulting in the review of 22 items with repetitions (Table 4). Overall, only five trophies were not attributed to the same age category, of which four shared a common category. As a result, the only discrepancy (i.e. 5% of the trophies reviewed) concerned a case where the reviewer diagnosed an age of 4/5 years while the Wildlife Division attributed the trophy to the CU category (under 4 years).

Table 4. Results of some blind tests conducted by three lion experts.

#	Reviewer I		Reviewer II		Reviewer III		WD
	Raw	WD categories	Raw	WD categories	Raw	WD categories	
A			5 years	To			To
B			5/6 years+	To (CA)			To (CA)
C			4-5 years	To			To
D					5 years	To	To
E			4 years	To			To
F					7/8 years	CA	CA
G	4-5 years	To	5/6 years+	To (CA)	5 years	To	To (CA)
H			4 years	To			To
I					3 years	CU	CU
J	4-5 years	To	4 years	To			To
K	4-5 years	To	5/6 years+	To (CA)			To
L			5 years	To			To
M			3 years	CU	3 years	CU	CU
N	4-5 years	To	3-4 years	CU (To)			CU
O	4-5 years	To	5 years	To			To

Age Category used by the Wildlife Division (WD):

CA 6 years and more

To 4-5 years

CU under 4 years

To (CA) might be 5 years but attributed to CA due to benefit of doubt

CU (To) might be 3 years but attributed to To due to benefit of doubt

6.3.4 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 a lion's age cannot be assessed without uncertainty (e.g. Whitman and Packer 2007; Ferreira and Funston 2010).

The Wildlife Division, with the intention of improving its age diagnosis methodology, has recently launched a study in collaboration with 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 study in October 2012 and January 2014 where sixteen known-age male lions were sampled (including X-Ray of lion teeth). The dataset has been analysed together with a sample from South African lions to show that there is a positive relationship between pulp cavity closure rate and age in lions of 3-13 years of age, with accuracy of within six months. Findings of the study will enhance the capability of the WD to monitor the ages of hunting-harvested lions and more effectively enforce age restriction.

Now, the Wildlife Division plans to adjust (if necessary) the preliminary age diagnoses resulting from former trophy inspections.

Finally, the protocols for sampling and age estimation of hunted lions are well-established, and significant improvements have been made for estimating lion age.

Thanks also to the above lion aging protocols developed in Tanzania and from data obtained from measurements taken from lions aged 3–13 years for which exact ages were known, a method of calculating the pulp/tooth area ratio, which has been used extensively in forensic science, was recently described and is novel in the study of lion aging. *Ratio Of tooth AReas* (ROAR) offers improved lion age estimates for population modeling and investigations of age-related mortality, and may assist national and international wildlife authorities in judging compliance with regulatory measures involving age (White et al. 2016).

7. Annual harvest levels and international trade

7.1 Harvest levels

Considering the latest available estimate of lion population size in Tanzania (i.e. 16,800; Mésochina et al. 2010), safari hunting harvested a yearly mean of 1.34% (min: 0.53%; max: 2.46%) of lion males ranging in the country, for the past eight years (Table 5). This figure is considered as low and has decreased since the establishment of age restriction rules on lion hunting, i.e. the Tourist Hunting Regulations of 2010.

Table 5: Lion harvest for safari hunting over the past eight years in Tanzania.

Hunting season	Harvest of lion hunting trophies		
	Number	% of lion population	% of adult male population*
2007	146	0.87	2.17
2008	165	0.98	2.46
2009	132	0.79	1.96
2010	101	0.6	1.5
2011	85	0.51	1.26
2012	50	0.3	0.74
2013	54	0.32	0.8
2014	44	0.26	0.65
2015	39	0.23	0.6

* A conservative adult sex ratio of 0.4:1 was used

Since the implementation of the Tourist Hunting Regulations of 2010, and the adoption of the 6 years of age approach, quotas, offtakes and catch rate have declined (Figure 8).

Since the 2011 hunting season, i.e. after the Tourist Hunting Regulations of 2010, harvest rates for lions ranged from 0 to 0.68 harvested lions/1,000km² across the main ecosystems of Tanzania, and were always (but at two occasions, 2012 and 2013 in Serengeti) under the threshold of sustainable harvest (Figure 9, 10; Packer et al. 2011). Generally, in most regions, harvest rates have declined since 2011.

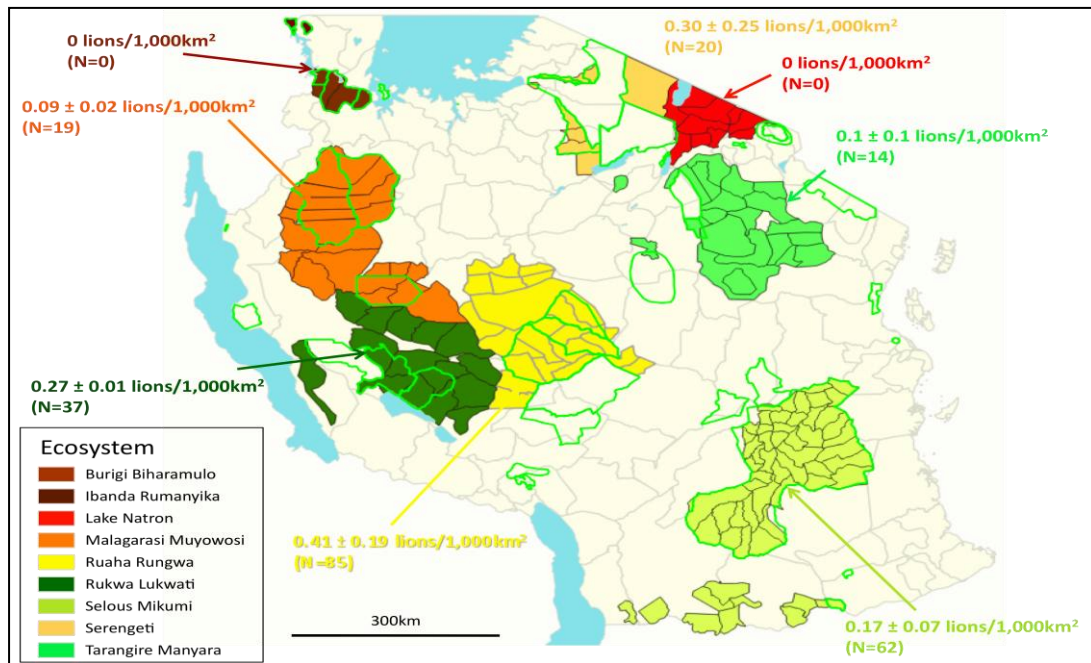


Figure 8: Regional harvest rates in the main ecosystem of lion range in Tanzania since the 2011 hunting season.

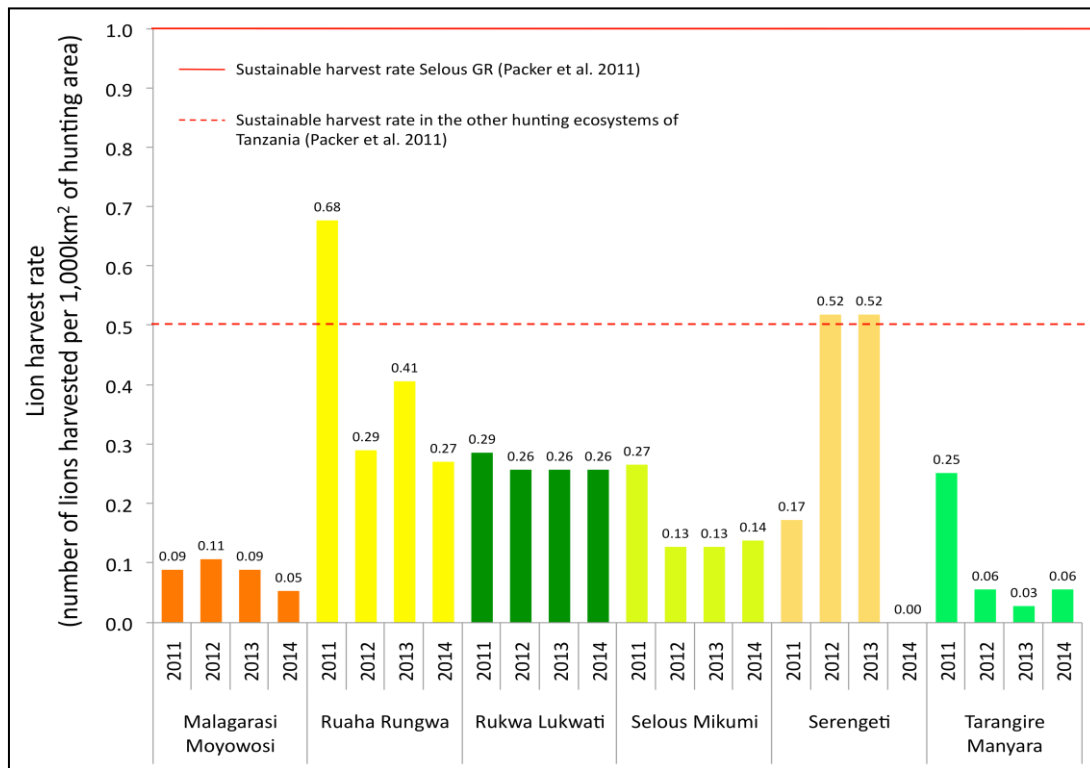


Figure 9: Average harvest rates in the main ecosystem of lion range in Tanzania between 2011 and 2014

Tanzania’s Tourist Hunting Regulations limit acceptable lion trophies to those ages 5 and above, and penalize any professional hunter and client who take a lion under age 5. Consequently, since the implementation of these Regulations in Tanzania, the proportion of

harvested males above 6 years old increased from 3.5% to 33.3%, whereas the proportion of harvested males below 4 years old decreased from 22.4% to 11.9% (Figure 11). We expect this percentage to continue to decline due to the deterrent penalties, continued training of professional hunters, and increasing number of overage males.

Since the implementation of the Hunting Regulations of 2010, and the adoption of the 6 years of age approach, professional hunters are generally careful not to harvest an under-age lion (due to the penalization mechanisms), and therefore harvest and catch rates have declined since the 2010 hunting season (Table 5 and Figure 8, 9, 10), whereas the proportion of harvested males above 6 years old has radically increased (Figure 11).

Hence, since the entry into force of the Hunting Regulations of 2010:

- Offtakes have been reduced by ca. 60%;
- Offtake levels, both at national and regional scales, have been kept way below the sustainable harvest rates suggested by Packer et al. (2011);
- The average age of the harvested lions has increased, with a proportion of lions above 6 years old that is ten (10) times higher in 2014 than 2011.

Tanzania is committed to keep on monitoring lion hunting in Tanzania, and to keep on assessing the impact of the Hunting Regulations of 2015 on the sustainability of lion hunting in Tanzania.

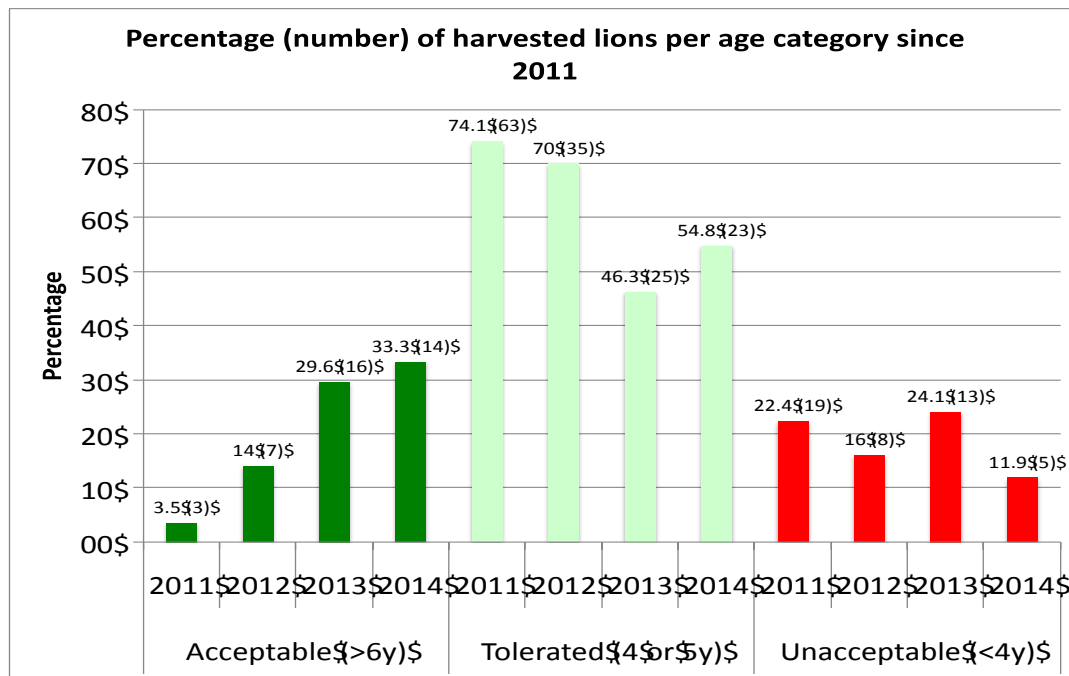


Figure 10: Percentage (and number) of the harvested lion males in each age category since 2011 in Tanzania.

Data of 2015 hunting season are not definitive. They will be added up to the on-going monitoring on trends of harvest rates and age of harvested males, at the national, regional, and hunting block levels.

7.2 International trade

All data of international trade in plants and animals, or parts and derivatives of plants and animals included in the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), are stored in the CITES Trade Database, which is maintained by the UNEP World Conservation Monitoring Centre (UNEP-WCMC). This database represents the official trade figures in CITES-listed species, as reported by CITES Parties in their annual reports to CITES.

We find that the statement of USFWS ESA Final Rule on Lion (USFWS 2015) on page 80024 is probably and partially incorrect in the part concerning trade data, probably due to misunderstanding of the CITES Trade Database. USFWS wrote: *Tanzania, with one of the largest lion populations (Hamunyela et al. 2013, pp. 29, 283; Riggio et al. 2013, p. 32; Ikanda 2008, p. 4; Baldus 2004, pp. 5, 6), was the largest exporter of wild-origin lion trophies, but their exports have decreased significantly since 2008. In 2008, approximately 138 trophies were exported from Tanzania; in 2010, 128 were exported; in 2011, 55 were exported; in 2012, 62 were exported (it should be noted that in 2012 Tanzania established an annual quota to limit trophy hunting to no more than 50 animals (Jackson 2013, p. 7); and in 2013, 11 were exported (UNEP–WCMC 2014, unpaginated). Again, it should be noted that there may be discrepancies between the annual quota and the actual number of trophies exported in a given year (see <http://www.cites.org/common/resources/TradeDatabaseGuide.pdf> for additional information). Regardless, the numbers of lion trophies exported by Tanzania according to the UNEP–WCMC CITES Trade Database suggest a decreasing trend.*

While the export and the harvest have rightly significantly decreased thanks mainly to the age-based provisions, Tanzania has never established a hunting quota in 2012 to limit Safari hunting to no more than 50 animals. Most likely the confusion arises from the fact that the offtake has been 50 animals in 2012 as a result of the implementation of the age based restrictions explained fully in this document and that due to the time associated with trophy preparation and export, CITES trade data do not accurately reflect offtake on a year to year basis.

Further the USFWS used a Gross Export report generated from the CITES trade database as referenced in the Supporting Documents for the Final Rule found at Docket FWS–R9–ES–2012–0025 on the website www.regulations.gov.

It is important to note that, according to the guide to using the CITES Trade Database, Gross and Net Export reports tend to overestimate trade levels. as where different quantities have been reported by the importer and the exporter, the larger quantity is presented in the output. (http://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf)

It is important that the Comparative Tabulations Report type is used for the trade analysis.

In a comparative tabulation retrieved from the CITES trade database using the trade terms “skins”, “trophies” and “skulls” (as Skulls are sometimes traded separately from a skin or a trophy although most of the times the skin and skull of the same lion are shipped together and double counting can occur, see table 6a and 6b for example.), and selecting the year range 2010-2015, Tanzania as the country of export, “All countries” for importing countries, “All sources”, “All purposes”, selecting “skulls”, “skins” and “trophies” for trade terms, searching by taxon: *Panthera leo*, selecting output type “csv”, and selecting report type “Comparative Tabulations”, the following data were retrieved and are presented in tables 6a, 6b and 6c.

Table 6a Export of *Panthera leo* (Trade Term Skulls) 2010 – 2014 Source: CITES Trade Database- Comparative Tabulation

App.	Taxon	Term	Unit	Country	2010	2011	2012	2013	2014
II	<i>Panthera leo</i>	skulls		TZ	46	5	7	9	0

Table 6b Export of *Panthera leo* (Trade Term Skins) 2010 – 2014

App.	Taxon	Term	Unit	Country	2010	2011	2012	2013	2014
II	<i>Panthera leo</i>	skins		TZ	46	6	7	6	1

Table 6c Export of *Panthera leo* (Trade Term Trophies) 2010 – 2014

App.	Taxon	Term	Unit	Country	2010	2011	2012	2013	2014
II	<i>Panthera leo</i>	trophies		TZ	20	6	10	3	39

Other exports recorded in Tanzania include parts and derivatives such as specimens for scientific purposes. (CITES trade database). Note that due to the time associated with trophy preparation and export, CITES trade data do not accurately reflect offtake on a year to year basis. As such, lions reported in international trade are not necessarily from Lions harvested in the same year they are exported as international trade may be from harvests in many different hunting seasons which can date back several years.

In any case Tanzania is fully convinced of the correctness of its lion harvest data as reported in Table 5 and will explore with UNEP-WCMC and interested Parties methods to mutually improve CITES Trade Data.

As the quantities reported from the importing countries in some cases and years differs from the quantities reported by Tanzania and in order to improve consistency with the standard procedure adopted by CITES, Tanzania would like to facilitate verification of CITES permits issued, in the following ways:

- Parties should be requested to verify the authenticity of CITES documentation issued by Tanzania through a request for verification of CITES documentation to the CITES Management Authority of Tanzania;
- The CITES Management Authority of Tanzania will provide information to allow permit verification (e.g., provide a copy of the permit or certificate as issued, or verify a copy of the document provided by the importing country); and
- The CITES Management Authority of Tanzania will provide information within 15 business days of the request for verification. If this is impossible, the CITES Management Authority of Tanzania shall reply within 15 business days and indicate a date by which they consider it will be possible to provide the information requested.

The above illustrated procedure will be communicated to the CITES Secretariat requesting the issuance of a Notification to the Parties.

The level of illegal use of lion parts in Tanzania is currently unknown, and there has so far been no evidence to suggest that it may be a driver for the poaching of lions. Impacts of trade in lion bones and other body parts is recognized as being potentially detrimental to wild lion populations (Williams et al. 2015.), although the bulk of the trade originating from South Africa is from captive-bred specimens. One of the few cases in possession of the Wildlife Division is represented by the arrest, at Dar-es-Salaam airport in 2009, of 4 people trying to smuggle ivory to China in a suitcase that contained also 60 Lion claws and teeth.

8. Lion Management

African lion conservation in Tanzania is implemented through a number of government agencies, under the Ministry of Natural Resources and Tourism. The Director of Wildlife coordinates the activities within the Wildlife Division and other agency such as the TANAPA agencies, Ngorongoro Conservation Area Authority (NCAA), TAWIRI, and at District level through the Tanzania Carnivore Action Plan (2009).

8.1 Management Plans

The Carnivore Action plan published by TAWIRI in 2009 includes an Action Plan for the African Lion and Leopard. (ANNEX 3).

This was the result of the Tanzanian Lion and Leopard Conservation Action Plan Workshop that was held 20th-22nd February 2006 at the Tanzania Wildlife Research Institute (TAWIRI) headquarters in Arusha. The workshop brought together stakeholders to assess existing information and set priorities for conservation of lion *Panthera leo* and leopard *Panthera pardus* in Tanzania. The workshop was attended by 17 participants from TAWIRI, Wildlife Division (WD), Tanzania National Parks (TANAPA), Ngorongoro Conservation Area Authority (NCAA), Forestry and Beekeeping Division (FBD) together with a representative from the hunting community and lion and leopard experts.

The representation of the institutional stakeholders responsible for lion management is nowadays the same with the exception of the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism that in 2011 was transformed into the actual Tanzania Forest Services (TFS) Agency. <http://www.tfs.go.tz>.

Since the publication of the Lion and Leopard Action Plan, TAWIRI has implemented it through continued long term monitoring of lion populations in several key areas. Also several surveys were done as indicated on table 1.

Furthermore, it is continuously following issues related to human-lion conflict through several ongoing conflict-mitigation activities. TAWIRI Veterinary Service Unit continues to survey and collate information on diseases of lions and other carnivores. There have been efforts to ascertain and map the entirety of the lion range in Tanzania in order to determine the extent which is protected.

Also as part of implementation of the Action Plan, the Wildlife Division since 2009 is collaborating through a Memorandum of Understanding with the International Foundation for the Management of Wildlife (IGF Foundation). This has resulted in several important achievements in lion conservation such as the 2010 Lion Status report (Mesochina 2010), the lion hunting monitoring system of which the age restriction system is an important component and surveys performed by TAWIRI in collaboration with IGF.

Specific implementation activities on the Lion and Leopard Action plan includes:

Management: The Management and Scientific Authorities have 1) made a countrywide status assessment which has established the extent of the lion range, population size and overall threats (Mesochina et al., 2010). 2); maintained population monitoring of trends in key lion populations (Selous, Serengeti, Ngorongoro and Tarangire); 3) conducted three major population surveys of key lion hotspots (Selous (hunting areas), Rungwa (hunting area), and the Maasai Steppe (Human-lion conflict hotspot); and 4) conducted a census of the West Kilimanjaro trans-boundary lion population in conjunction with Kenya Wildlife Authorities.

Mitigation: The Management and Scientific Authorities have i) established a consolation scheme through the Dangerous Animals Damage Consolation Regulations 2011 (see section 9.1); and ii) established research priorities and research projects supported by Conservation NGOs to address human-lion conflict among pastoralist communities. This is demographic segment of the human population the most affected by lion damages in Tanzania. These projects aim at improving husbandry practices through enhanced protection of livestock at the bomas and herding. Projects involve communities in the high human-lion conflict regions of Maasai Steppe, Ngorongoro Conservation Area, Ruaha-Rungwa landscape and Rukwa-Katavi ecosystem (see section 4.1).

Socio-economics: The Management Authority has established a system of socio-economic benefits to local communities living with wildlife, including lions. The WD division disburses 25% of hunting fee revenue (including hunted lions) back to District Councils (see section 10). TANAPA has increased its Community Based Conservation programmes which foster

development projects in villages surrounding National Parks. Hunting companies have offered substantial support for development in rural communities (see Table 2). Photographic tourism's contribution to conservation is also important and figures and projections are maintained mainly by TANAPA.

Policy and land-use: The Management Authority continued with the establishment of WMAs in order to foster lion conservation at the human-lion interface.

Trade: Management Authority continued with the sustainable utilization of lions through safari hunting. Major amendments have been made to Hunting Regulations (2010 then 2015) for greater sustainability. The sustainable harvest rate has been determined for lions and a pioneering Trophy-Monitoring Programme has been established and is implemented by the Wildlife Division.

The Ministry of Natural Resources and Tourism through its Wildlife Division, depending on the availability of funding, would like to gather the institutional stakeholders which have a responsibility on lion management, in order to update the plan and make it specific for Lion, also in accordance with recent developments in legislations, regulations and strategies on wildlife conservation in Tanzania. The WD is actively looking for donor support for the project.

9. Threats

9.1 Human-lion conflict

In Tanzania, the main source of illegal killing of lions originates from Human-Lion conflict. (Figure 11)

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 per cent or more by 2100 (United Nations 2011). During 2011-2100, six countries are expected to account for half of the world's projected population increase, Tanzania being among them (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.

Human-lion conflict occurs when lions become problematic to local communities by threatening, and or attacking human beings and property such as livestock. This year close to 10 attacks occurred on humans and 150+ on livestock (cattle, goats, sheep, dogs etc.) were killed.

Retaliation for these livestock losses is done through spearing, poisoning and ritual hunting.

Although it is impossible to give an exact estimate of how many lions are killed in retaliation of livestock damages or human killings, they should account for a number possibly between 100 and 200 lions. (Ikanda *pers.comm.*).

This mainly occurs within pastoral communities which rely on livestock for their livelihoods and indiscriminate killings of lions poses the most significant threat to the species. It is not only a major concern for lion conservation, because this triggers retaliatory killing of lions for attacks on livestock, but especially for human security and lives.

During the past years, simply at the eastern border of Tarangire National Park, large carnivores have carried out approximately 50 attacks on livestock per community each year. Retaliation against livestock depredation killed 6–7 lions per community per year on the Maasai Steppe. This equated to an annual loss of 72–84 lions across 12 communities (Lichtenfeld 2005; Kissui 2008).

Lion attacks on humans are especially high in central and southern Tanzania. Here close to 10 attacks occur annually, but have gone up to over 100 in some years. Between 1990 and 2004, lions killed at least 563 people and injured more than 308. (Packer et al. 2005; Species

Survival Commission Cat Specialist Group 2006; Ikanda 2007, Packer et al 2007). The total number of attacks, updated to 2015 has been estimated to more than 1,050 with the majority among the poorer rural people. (Ikanda, pers.comm.). This tremendous loss of human lives puts a major responsibility over the wildlife authorities.

In accordance with the Wildlife Act of 2009 when a lion attacks a human it shall be eliminated and most attack results in lions being killed in problem-animal control. Although the killings are largely controlled, the sheer number of attack incidences can lead to a significant number of killings. Less than 10 lions are killed through official “problem animal control” (PAC) for this reason per year (WD data).

There are various options for human/lion conflict management and how they might be perceived by stakeholders. In this regard Chardonnet et al. (2010) wrote the following and a table (Table 7) that contains some major points:

Prevention of conflict is the key to coexistence. Land-use planning to ensure that human activities are not carried out in wildlife protection areas helps to prevent human/lion conflict; there is also a need for community awareness about behavior, triggers for lion conflict, animal husbandry and planning. Incentives are often needed: a promising approach is to establish innovative insurance schemes supporting best practices.

Protection of people and livestock from lions, for example with bomas and wise use of pastoral rangeland is a second strategy. Livestock areas should be selected with regard to wild habitat, and buffer areas should be established between them and carnivore areas.

Mitigation by ensuring that people perceive the lions more positively can be applied in cases where human/lion conflict is common. Interest in the benefits generated by lions will increase tolerance; in areas with little photographic tourism, trophy hunting could generate income and give people a sense that the lion population is being controlled.

Table 7 Synthesis of management options. Efficiency, costs and durability are graded from 1 to 4 by increasing value of each variable. Perception is graded as: P = poor, N = neutral, G = good, I = needs incentive, D = donor dependent, S = institutional/commercial support, C = requires community involvement, E = ethical or conservation issues. (From: Chardonnet et al.2010)

Management option	Efficiency	Cost	Durability	Perception
HUMAN MANAGEMENT				
Community awareness	4	2	4	N/S,C
Compensation				
Direct compensation: subsidies and insurance	3	3	3	P,N/I,D,S
Indirect compensation: wildlife valuation	4	3	4	G/D,S,C
LIVESTOCK MANAGEMENT				
Intensifying human vigilance	3	1	2	P,N/I
Livestock guarding animals	4	2	3	N/I
Use of enclosures	4	2,3	3,4	N,G/I
Grazing and herd management	4	1	4	N,G/I
LION MANAGEMENT				
Non-lethal				
Deterrent methods	1,2	2,4	1	P,N/I,D
Translocation of lions	1,2	4	1	P/D,I
Contraception	1	4	1	P/D,E
Lethal				
Off-take by the administration	2	2,3	3,4	P,N/E
Off-take by populations, farmers and breeders	4	1,2	3,4	G/C,E
Off-take by trophy hunters	1	1	3	N,G/I,D,E
ENVIRONMENTAL MANAGEMENT				
Increase alternative prey	3	1	4	N,G
Land use planning				
Planning/manipulating wildlife and village distribution	2,3	3	2,3	P,N/I,O,S,C
Zoning round protected areas	4	3	3,4	N,G/I,S,C

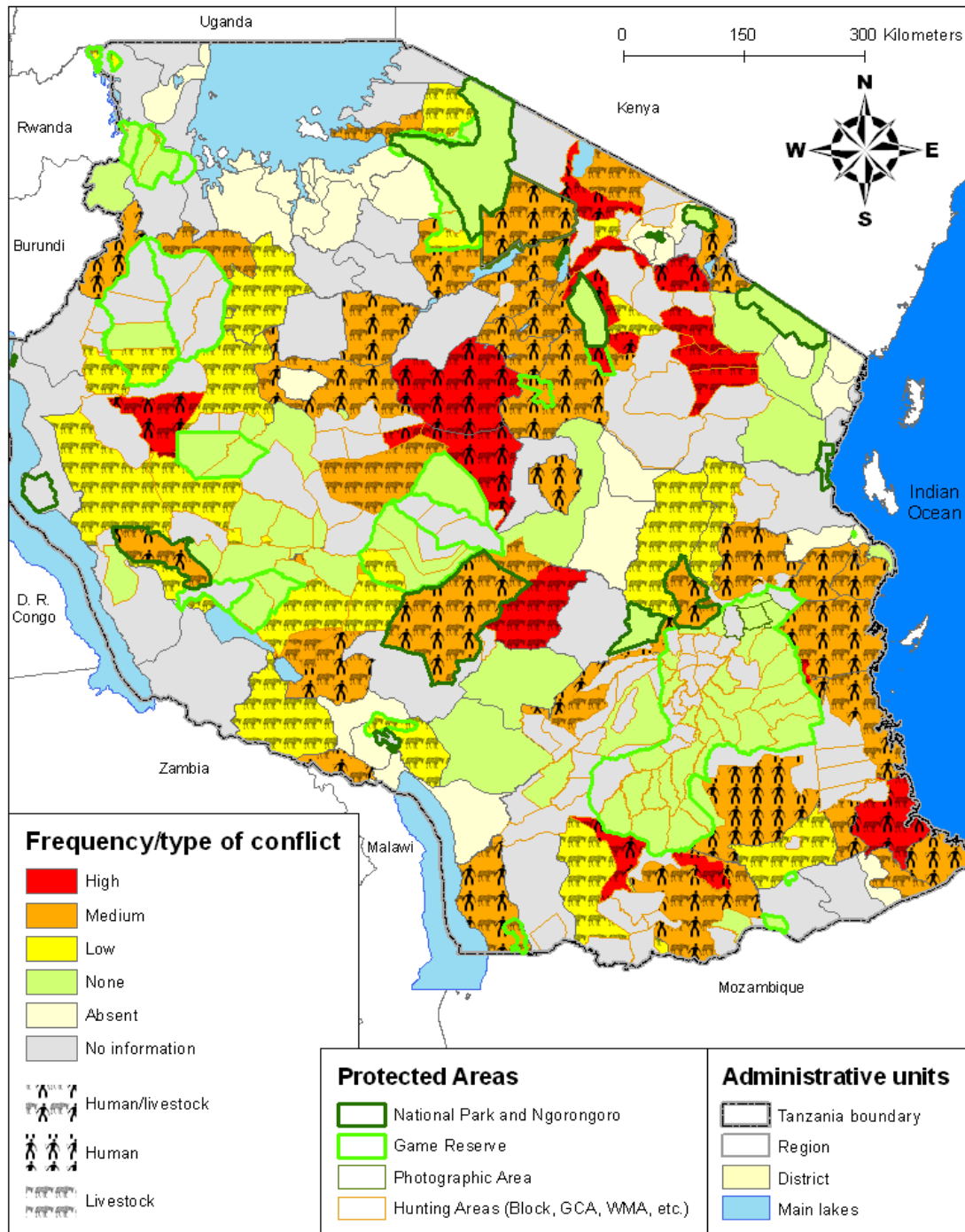


Figure 11: Frequency and type of human/lion conflicts in Tanzania (by January 2010). Absent: lion presence not recorded in the area; None: conflict presence not recorded in the area; Low: conflicts reported once or twice without human death; Medium: conflicts reported every year and/or with at least one human death; High: conflicts reported several times per year and with human casualties and/or a high number of livestock losses.

As referred in section 8.1, Tanzania established a mitigation scheme for lions and other wildlife species through the Dangerous Animals Damage Consolation Regulations 2011 (Annex 4). This scheme is applied in the entire country where people affected by the loss of relatives and livestock to lions and other wildlife species are consoled through payment-in-kind. The scheme aims to increase human tolerance for lions, hence reduce the number of indiscriminate killings at the human-lion interface.

Wild lion populations outside national parks only have a future if rural people see a direct benefit of coexisting with them. The revenue from official and controlled hunting encourages the lion range states to leave hunting blocks as wilderness areas and refrain from converting them into pastoral rangeland and agricultural land with the associated loss of biodiversity. Together with elephants, lions are the most valuable trophy hunting species and to remove them from the quota would render trophy hunting in many areas less economic or not economic at all. Banning lion trophy hunting or creating international trade barriers for hunters to take home legally obtained trophies removes the economic as well as the management and law enforcement incentives that are necessary for conservation. (Baldus and Michel 2011)

Furthermore, mitigation programs such as the one initiated by Lion Guardians, are aimed at promoting coexistence between lions and local communities, a formidable challenge in a country where lion range covers more than half of a nation experiencing rapid human population growth.

9.2 Habitat loss

Tanzania is the only country which still has a large population of lions outside of gazetted protected areas. The lion is there by virtue of the fact that as a species it is protected wherever it should occur. Nevertheless, this portion of habitat is now increasingly subject to rural population expansion which inevitably leads to the lions and other wildlife being pushed back towards the protected areas which adjoins these marginal lands.

The second biggest potential long-term threat to the Tanzania lion population, after retaliatory killings, is the potential and real loss of habitat and the fragmentation of range through the interruption of access routes and conflicts with people in the absence of effective incentive mechanisms to maintain such habitat. Lions, through their negative impacts on livestock, can easily be excluded from large parts of Tanzania outside protected areas. Without a way of benefiting from lions, lions are regarded as a liability and economic cost to rural communities, who suffer livestock losses and lose human lives to lions. The most effective strategy to prevent this displacement is to integrate lions into rural economies as assets and to demonstrate that lions contribute to the welfare and development of people. The involvement and empowerment of rural people in natural resource management, in combination with economic and financial incentives through sustainable use, and linked with skills development and capacity building, are the main driving forces behind changes in attitudes towards wildlife in communities that owns livestock but not wildlife. This strategy has the ultimate goal of conserving habitats.

Habitat loss can be exacerbated by a decrease in overall revenues from safari hunting; the lack of incentives for safari operators due to international campaigns or decisions by importing countries have the potential to decrease the investments in habitat protection done by the hunting sector, and decrease tolerance of rural communities toward lions with habitat .

Although habitat and range of lions has been documented to be decreasing in a number of lion range countries (Henschel et al., 2010; Riggio et al., 2012), 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). However, as noted in the previous paragraphs, there are increasing and potential pressures on habitat as marginal lands are village lands and consequently suffer from rural population expansion through establishment of settlements and agricultural activity. This human encroachment is spreading around and over natural habitats, and is potentially exposing more and more human populations to lions.

Importantly sport hunting is playing and can play an important role in the general framework of management of protected areas to prevent them being abandoned or converted to agriculture and to find ways to improve the lives of people living with wildlife. These habitats

are critically important for lion conservation and ecotourism is not a viable alternative in many of them. Tanzania is looking at solutions and best practice guidelines for securing wildlife (including lion) landscapes and habitats and prioritizing its conservation efforts.

9.3 Poaching

Poaching of lions (not to be confused with retaliatory killings) is recorded in very low numbers in Tanzania (10-20/year). Records mainly come through from anti-poaching records of Wildlife Management Authorities that result from impoundment of body derivatives such as skins, teeth/claws, body fats and bones. These may be sought after for local traditional medicinal use. Poaching mainly occurs outside the Protected Areas (PAs) network, but lions along PAs' boundaries and margins are also incidentally snared as non-target prey.

In general, Tanzania has developed a National Anti-Poaching Strategy that provides an effective program of support to combat poaching and illegal wildlife trafficking in Tanzania through a three-pronged approach: (i) Strengthening law enforcement through investing in capacity building to strengthen law enforcement, establish and maintain national cross-agency mechanisms and streamlining cross-border and regional cooperation through better coordination (ii) Increase capacity of local communities to pursue sustainable livelihood opportunities and eradicate poverty (iii) raising awareness in supply, transit and destination countries to help change attitudes towards wildlife crime and building international support. (MNRT 2014).

Furthermore, as a member of the Southern African Development Community (SADC), Tanzania is implementing the SADC Law Enforcement and Anti-Poaching Strategy (SADC 2015), approved by the SADC Ministers responsible for Environment and Natural Resources on 6th November 2015. This strategy will complement the National strategy and will provide, inter alia, for stronger regional cooperation on the issues pertaining to illegal use and trade of wildlife.

9.4 Bushmeat Poaching and Prey Abundance

Poverty stands as the major driver of illegal hunting as households vie for income and sustenance. Livelihoods of illegal hunters have been augmented considerably through revenue generated from bushmeat sales. Illegal hunters use bushmeat both for supplementing household protein and for economic gain. (Knapp,2012)

Poaching for bushmeat is an important livelihood component of rural communities in Tanzania and a vast literature exists on this subject (among others, specific to Tanzania: Ceppi et al. 2014, Knapp 2012, Loibooki et al., 2002, Martin and Caro 2013, Mfunda et al. 2010, Nielsen et al. 2014, Ndibalema and Songorwa 2008, More general: Lindsey et al 2015a and 2015b).

Poaching for bushmeat does not seem to have observably impacted the overall lion's status in Tanzania, but more research is needed to fully understand its impact on lion.

The extent to which bushmeat poaching is depleting lion's prey is not completely known.

Prey abundance is still high in several Tanzanian Ecosystems. As abundance of prey species is highly correlated with lion density (Hayward et al 2007) and as Lions exhibit a strong preference for larger bodied prey including African buffalo, *Syncerus caffer*, (Hayward & Kerley, 2005), data on the main prey species for lion, extracted from TAWIRI aerial surveys reports of 2014 and 2015, are shown in Figures 12 to 16 below.

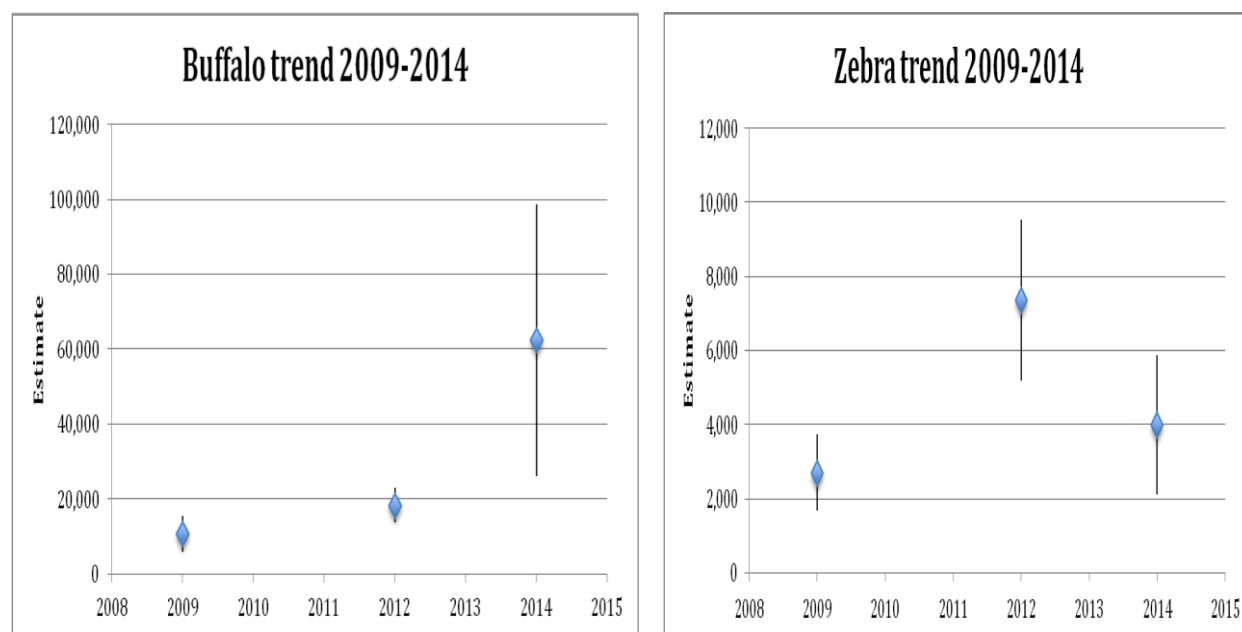
The figures for Ruaha-Rungwa needs to be interpreted cautiously as the quality of surveys prior to 2009 was not optimal. In this ecosystem during the period 2009 -2015 the buffalo population increased while the zebra population remained stable or had a slight decrease.

Figure 12 Ungulates estimates in the Selous-Mikumi Ecosystem 2009 and 2014

Year of Survey	2009		2014		5-year trend
Surveyed Area	80,390 km ²	SE	88,166 km ²	SE	
Species name	Estimates		Estimates		
Buffalo	41,493	9,631	78,231	14,122	+ Increase
Hippo	11,333	2,247	23,756	5,503	+ Increase
Puku	6,780	2,269	3,055	899	- decrease
Impala	19,204	3,461	23,677	4,198	+ Increase
Zebra	12,763	1,832	16,240	2,391	+ Increase
Duiker	2,992	702	5,984	550	+ Increase
Eland	2,056	507	5,488	1,359	+ Increase
Giraffe	1,202	387	3,155	1,877	+ Increase
Greater Kudu	78	45	927	255	+ Increase
Hartebeest	10,677	3,860	21,672	2,710	+ Increase
Sable antelope	2,277	833	4,885	985	+ Increase
Warthog	2,979	485	7,691	733	+ Increase
Waterbuck	3,444	753	5,003	1,459	+ Increase
Wildebeest	20,591	5,066	16,939	5,131	Stable?

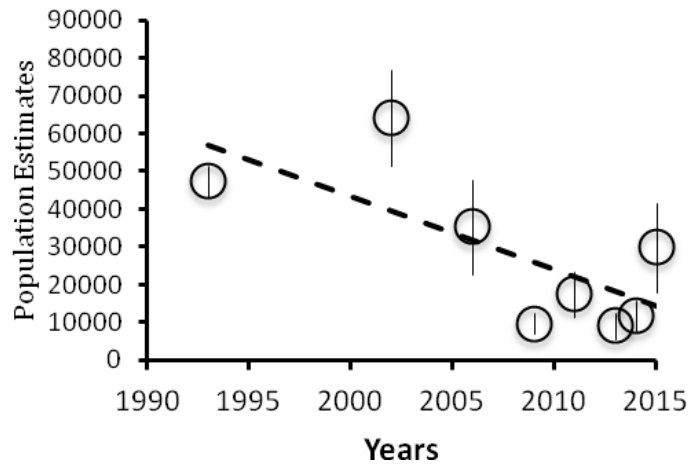
Source: TAWIRI 2015

Figure 13 Buffalo and Zebra trends in Katavi-Rukva Ecosystem



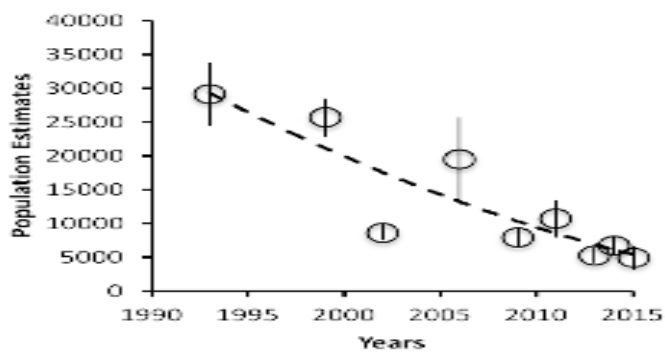
Source: TAWIRI 2015

Figure 14 Buffalo Population Trend Ruaha-Rungwa Ecosystem



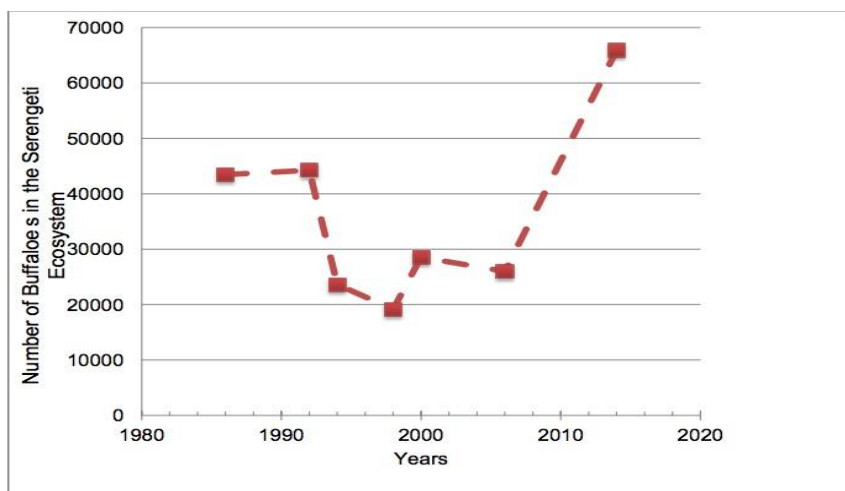
Source: TAWIRI 2015

Figure 15 Zebra Population Trend Ruaha-Rungwa Ecosystem



Source: TAWIRI 2015

Figure 16 Buffalo population trend in the Serengeti Ecosystem



Source: TAWIRI 2015

10. Community partnership, benefit and participation

10.1 Overview

Tanzania firmly believes that wildlife conservation cannot be achieved without taking into account the human dimension which is attached to it. Poverty remains the first and foremost cause of poaching in Tanzania and in the rest of Africa, where nearly 50% of the population live on slightly more than one US dollar a day. Tanzania recently improved its policy on community benefits sharing in hunting and photo tourism fees and governance of the wildlife sector by local communities to achieve poverty reduction through legal and sustainable wildlife utilization.

Tanzania shares with other countries in the region the view that, community-based initiatives and policies must be given the support they need to deliver incomes to local people through legal, regulated wildlife utilization, incomes that are crucial in alleviating poverty. This support shall include the right for local communities to be consulted as equal partners in wildlife conservation. The consequences of ignoring or failing to encourage such community operations, in social contexts steeped in poverty, is well established. Poaching increases, often with the same local people recruited into poaching gangs, by organized criminal syndicates. Community-based natural resource programs are one of the most crucial and important part of the solution to the poaching and illegal trade in wildlife.

An exclusively biological focus on the sustainability of wildlife harvesting and trade can never guarantee sustainable use of any species, in fact it tragically refuses a critical tenet of sustainability as a principle, which requires, in its applications, an ecosystem scale of assessment, in which the social systems with their cultural, economic and political dimensions are embedded. The same applies to an exclusive focus on species rather than to the human and social dimensions of conservation.

Tanzania has been implementing Wildlife Management Areas since 1998, to varying degrees of effectiveness. The regulations governing WMAs were amended several times, and national Wildlife Conservation Act was ultimately revised to more completely devolve authority to the local communities who live side-by-side with wildlife. Under this Act, these communities are better able to benefit from wildlife use (consumptive or non-consumptive). Part V (and especially Section 31) of the Act provides guidance of the establishment and management of the WMAs, and specifically on the legal requirement for benefits sharing between operators, Tanzania's government and communities through WMAs.

The regulations governing WMAs were revised in 2012 to improve benefits sharing in keeping with the policy objectives of the Wildlife Conservation Act of 2009.

In general WMAs are key aspect in fighting poverty through wildlife utilization. If wildlife is seen as an asset and not a nuisance to rural people of Tanzania, they will greatly contribute to its conservation and not to its destruction. The potential of WMAs is enormous to conserve natural resources outside protected areas through consumptive and non-consumptive tourism or other forms of development. In brief WMAs represent the community based conservation system of Tanzania and they are seen as a key component of rural development and as one of the best weapons in the fight against illegal utilization.

Table 9 provides an overview of the revenue sharing generated from safari hunting in WMAs that was in place until July 2015. Of the other lesser fees (game fees, observer fees, conservation fees), the WMA gets 45% while the rest is divided between Wildlife Division, Treasury, and District Council.

Table 9: Revenue sharing generated from safari hunting in Wildlife Management Areas (up to July 2015)

No.	Type of fee	TWPF	WMA	DC	TR
1.	Block fee	25%	75%	0	0
2.	Game fee	25%	45%	15%	15%
3.	Conservation fee	25%	45%	0	30%
4.	Observers fee	25%	45%	0	30
5.	Permit fee	25%	15%	0	60%

TWPF-Tanzania Wildlife Protection Fund, WMA-Wildlife Management Area, DC-District Council, TR-Treasury

The table above shows the situation up to July 2015.

During a Workshop held in Arusha 2nd and 3rd July 2015 the Minister of Natural Resources and Tourism ordered urgent review of the benefit sharing arrangement. Table10 shows the new arrangement for benefit sharing of Safari hunting revenue in the Wildlife Management Areas

Table 10: New proposed revenue sharing generated from safari hunting in Wildlife Management Areas

No.	Type of fee	TWPF	WMA	Change in % to WMAs	DC	TR
1.	Block fee	25%	75%	No Change	0%	0%
2.	Game fee	25%	65%	+20%	10%	0%
3.	Conservation fee	25%	70%	+25%	5%	0%
4.	Observers fee	25%	70%	+25%	5%	0%
5.	Permit fee	25%	70%	+55%	5%	0%

Therefore, the above arrangement replaces Twelfth schedule of the current WMAs Regulations (2012) and they are already in operation pending forthcoming revision of the WMA Regulations, which is in progress and should be published soon.

This ground-breaking initiative places Tanzania right after Namibia in terms of the percentage of revenue sharing in favor of local rural communities in Africa. That is an impressive place to be. It is also an important step towards a full "devolution of authority to local communities" in the context of wildlife and natural resource management on which the Government of Tanzania has formed a national Task Force to analyze institutional arrangements needed to aim at the 100% of revenue sharing as in the Namibian CBRNM framework.

During the above mentioned workshop, other deliberations were taken which include the followings:

- ✓ Review of the WMA Regulations (2012) in order to improve governance in the WMAs. The review included, among other things, the benefits sharing schemes among MNRT, WMA, District Councils, and Treasury. The quick entry into force of this reviewed regulations is of critical importance.
- ✓ MNRT to continue with revenue collection but with improved disbursement to WMA stakeholders in order to avoid delays in disbursement upon payment of relevant fees through the electronic payment system.
- ✓ Review of the Non-Consumptive Regulations (2008) on benefit sharing schemes.
- ✓ Holding of a joint WMA stakeholders meeting annually in order to review progress made and challenges to WMA management.
- ✓ Building capacity of WMAs in many aspects including governance issues, but stakeholders need to agree on what capacity component need to improved.

Therefore, the underlined part of the statement contained in page 80011 of the USFWS ESA Final Rule on Lion (USFWS 2015) is incorrect: *Furthermore, many communities lack the rights over land and in most cases in Botswana, Tanzania, Zambia, and Zimbabwe, the government retains a significant portion of revenue from wildlife; therefore, those that bear the costs of wildlife do not receive benefits, and bushmeat hunting is the only way to benefit from wildlife* (Lindsey et al. 2013b, p. 88).

On the first part of the above-mentioned USFWS statement i.e. “*Furthermore, many communities lack the rights over land*”, we would like to remark that WMAs that are operational have obtained User Rights in Accordance with the WMA Regulation 2012. Therefore, the statement is incorrect.

As suggested by Kiffner et al. (2016) the key to successful wildlife conservation appears to be protection from (illegal) hunting and increasing people’s tolerance of wildlife (among others: Kinnaird & O’Brien, 2012).

Moreover, we would like to add that in May 2014 MNRT announced a joint MNRT – Ministry of Local Government Task Force to better define "devolution of authority to local communities" in the context of wildlife and natural resource management and conservation at the community level. The Task Force will provide indications on ways to improve governance and coordination of all wildlife and natural resource conservation efforts at the district level through clear lines of duties and responsibilities among relevant district/ward/village institutions. This was further discussed during the conservation partners meeting held in September 2014. The process is continuing and is being developed by both MNRT and the Ministry of Local Government.

Table 11 is a partial summary of hunting revenues in selected Wildlife Management Areas. Complete figures are being calculated by the AAC Consortium.

Table 11: Partial summary of hunting revenues in selected Wildlife Management Areas

WMA	CONTRACT	REVENUE (\$)				
		2010	2011	2012	2013	2014
BURUNGE	YES 2013	3,685	6,552	7,429	83,573	22,091
ENDUIMET	YES 2014	-	13,718	5,810		71,029
IDODI-PAWAGA		14,208	4,333	2,478	40,660	36,079
IKONA	YES 2014	31,422	61,722	10,677	182,034	226,698
IPOLE		2,834	23,409	13,382	27,148	12,868
LIWALE-MAGINGO	YES 2014	15,907	8,416	4,814	22,252	22,050
MAKAO		-	15,729	17,994	-	28,863
MAKAME-INDEMA	YES 2014					START OPERATIONS
MBARANG'ANDU		4,648	4,909	2,808	30,026	-
MBOMIPA	YES 2013					START OPERATIONS
NGARAMBE-TAPIKA	YES 2014	23,920	24,006	15,783	-	-
TUNDURU		2,875	4,620	2,643	-	-
UKUTU		-	27,758	28,923	31,058	45,054
UYUMBU		1,312	2,860	1,636	13,136	29,828
TOTAL		100,811	198,032	114,377	429,887	494,560

In some WMAs the revenue accrued is posted on notice bodies to ensure that locals understand the monies that their WMA gets from wildlife conservation activities. Such initiative is happening in Burunge and Enduimet WMAs.

10.2 Policy Achievements

The following are some of the Policy Achievements with regards to WMA establishment and conservation in general:

- ✓ The achievement of a fundamental shift in philosophy and approach regarding wildlife management in Tanzania.
- ✓ The approval of guidelines, laws and regulations including the Wildlife Conservation Act of 2009, and the WMA Regulations of 2012, which are critical in supporting the development of WMAs. Having a supportive legal framework helps the established WMAs flourish; encourages new WMAs to apply for gazetting; and demonstrates to the world that Tanzania is committed to CBNRM for the benefit of its people and wildlife.
- ✓ The gazettment of 21 WMAs that protect wildlife habitats and corridors, covering an area of 27,924Km² (roughly 3% of the Tanzania mainland), with 166 villages inhabited by about 480,000 people.
- ✓ The application for gazettment of 17 additional WMAs. Once the process of gazetting is duly completed, all the 38 WMAs will be operational and will extend the available lion, elephant, and other habitat in Tanzania. (Villages outside this process are approaching the government to form new WMAs.)
- ✓ Formation of the Authorized Associations Consortium (AAC), the apex body for all Authorized Associations(AA) As defined in the WMA Regulations of 2012 “Authorized Association” means a community based organization, whose primary objective is to conserve wildlife resources for the benefit of local community members ordinarily residing in that particular area. The AAC plays a critical role in the coordination, advocacy and implementation of WMA-related activities. The AAC provides a platform to the AAs to articulate their views and concerns of different stakeholders, plan and decide on matter of their common interests. The AAC provides an advocacy organization for WMAs, so they can promote policy change at the local and higher levels. The Consortium is a civil society organization intended to provide a platform to the AAs to articulate their views and concerns of different stakeholders, plan and decide on matter of their common interests. The organization was registered on 22nd January, 2010 under the Societies Act Cap. 337 (R.E. 2002), with certificate of registration No. 16619 as an umbrella for all WMAs which have attained " AA" status. The body has been mandated to operate within the framework of Wildlife Conservation Act (2009) and Wildlife Management Areas Regulations (2012).

The specific objective of AAC includes:

- *Promoting conservation and sustainable utilization of natural resources in the respective WMAs;*
- *Fundraising and laying down procedures for use of financial resources in order to improve social services such as schools, infrastructure and hospitals around member WMAs;*
- *Providing advisory services to AA members (particularly during planning of development projects), marketing, research and control of illegal offtake of natural resources;*
- *Liaison with government, non-governmental organizations and/or private sector actors in all matter that affect AA members positively or negatively;*
- *Dealing with issues related to licenses, permits and fees for natural resources*

based investments/businesses;

- *Ensuring good public relationships with governments, NGOs and other institutions that work together with member AAs;*
- *Creating an enabling environment for tourism and hunting business in WMAs;*
- *Promoting, training and encouraging Law enforcement and ensuring the rule of law in all WMAs; and*
- *Dealing with all other issues for the benefits of its members but in compliance with existing policies and legislations.*

AAC has finalized a 5 years Strategic Plan for its functioning. (Annex 5)

- ✓ The enhancement of resource and land tenure rights to villagers forming WMAs
- ✓ The disbursement of hunting fees to WMAs to incentivize wildlife conservation. From 2010 to 2014, in excess of USD 1.3 million from safari hunting fees has been disbursed to respective WMAs (Table 11). This amount of money has greatly contributed to poverty reduction through wildlife utilization, both consumptive and non-consumptive.
- ✓ For the first time in 2013, the devolution to WMAs of the power to sign utilization contracts with the private sector (consumptive and non-consumptive). These arrangements which will last for five years (2018) have enabled seven WMAs and therefore the villages and people living there to sign contracts with hunting operators worth more than USD 4.3 million.
- ✓ Under the leadership of AAC, the initiation of a pilot project in 2013 in seven WMAs to establish a ground wildlife monitoring system using scientific based census methods. This system is of paramount important for sustainable wildlife utilization and quota setting. The system uses a customized reporting system based on Namibian MOMS (Management Orientated Monitoring System) which is one of the tools used by the communities in these WMAs to achieve proper wildlife monitoring. Importantly this system will enable WMAs to propose quotas to the Director of Wildlife.
- ✓ The approval of the WMA Implementation Strategy by the Ministry of Natural Resources and Tourism and launch of this strategy during the Arusha Workshop in July 2015 (Annex 6).

The Wildlife Management Area (WMA) Implementation Strategy reviews, summarizes and uses over a decade of positive lessons learned to inform activity implementation across all the WMAs. It is a product of a series of participatory consultative meetings, formal and informal interviews/discussions as well as interactive workshops spanning from August 2009 to September 2012. The objectives of undertaking the preparation of the WMA Implementation Strategy are to: identify challenges and issues facing WMA implementation since the 2003 launch of 16 pilot areas; determine the extent to which the WMA process has laid the foundation for an expanded wildlife-based tourism industry as well as assisted in the protection of wildlife resources; determine the value of WMA process in establishing and strengthening a national approach to CBNRM; develop an adaptive framework for increased acceptance of the WMA concept in addressing poverty but reflecting local conditions, cultural values and institutional choices; and provide important resource base information that will inform any future WMAs in making conservation decisions which will ensure that future generations will not be denied of these precious resources that we enjoy and benefit from. It charts out a course for conservation and development in village land endowed with wildlife. Once operational the strategy will: provide guidance to Government, NGOs, local government, private sectors, and local communities in the implementation of different activities to support development of WMAs; highlight the best WMA management approaches that will enable scaling-up the implementation of WMAs and to secure more and tangible benefits to local communities, districts and the nation; and finally recommend strategic options to overcome WMA implementation challenges. A vision, mission and goal of the Strategy have been developed; a total of eight (8) strategies with a set of implementation mechanisms for each strategy underpin the implementation and form the cornerstone of the WMA Implementation Strategy for the period 2014 - 2019. (MNRT 2014a).

10.3 WMAs benefits

- ✓ Increased protection of ecologically important areas
- ✓ Increased financial benefits to the WD, Districts and villages adjacent to PAs
- ✓ Empowered local communities to manage wildlife resources in the WMAs
- ✓ Empowered local communities to use the revenue obtained for various activities such as community development projects (water, health, education), employment, anti-poaching patrols, advocating conservation awareness, problem animals control, training of village game scouts, and other services to benefit the communities on the whole
- ✓ Provided the private sector with a wider scope to invest in tourism and hunting
- ✓ Improved conservation - wildlife and habitat restoration

11. Revenues and expenditure from safari hunting

As briefly outlined in section 4.1, Tanzania Wildlife Protection Fund (TWPF) was established under Parliament Act No. 21 of 1978 as provided in Section 69 of the Wildlife Conservation Act (WCA) No. 12 of 1974. The existence of TWPF is also underpinned in the section 91(1) of current WCA No.5 of 2009. TWPF Secretariat supervises and coordinates funding activities as per directives from the TWPF Board of Trustee. Director of Wildlife is the Chief Executive Officer (CEO) of the fund and Administrative Secretary (AS), who is the accounting officer of the fund, is the principal assistant to the CEO. TWPF started its operations in 1983 after receiving seed money from Government Treasury.

TWPF continuously supports Game Reserves in infrastructure development such as road construction and maintenance, staff houses and office construction, water supply system among others. Nevertheless, TWPF supports quarterly direct cost for carrying anti-poaching activities in Game Reserves in order to supplement low budgetary allocation from Government Treasury. This is done in recognition to the contribution of Tourist hunting which is mainly conducted in Game Reserves, which account for over 70% of total TWPF earnings. Similarly, TWPF supports infrastructure development and direct cost for carrying anti-poaching activities in Zonal Anti-Poaching Units (ZAPUs). This is because Protected Areas (PAs) in Tanzania are not fenced and wildlife does not recognize strip boundary demarcations, hence ZAPUs mainly ensure survival of wildlife resources outside core PAs through anti-poaching operations and law enforcement. As a mechanism of providing incentives to the communities in districts that participate in wildlife conservation, TWPF supports community development projects such as building of schools upon screening of submitted proposals based on the stipulated criteria in TWPF guidelines for funding.

To-date, over 74% of the TWPF revenue is obtained from 25% of the total proceeds from the wildlife harvest in Game Reserves and Open Areas (OAs). Other sources include photographic tourism, donations, grants and fortified properties in accordance to Section 110 of Wildlife Conservation Act (WCA) No. 5 of 2009. It is the responsibility of the TWPF to solicit funds from other sources and invest in income generating activities to meet growing demand and challenges in wildlife conservation.

Safari hunting, including lions, is the main source of revenues for the Wildlife Division/TWPF (Table 12) and will be also the main source of revenues for the developing Tanzania Wildlife Authority (TAWA) and therefore for wildlife conservation in the country.

Funds generated from tourist safari hunting benefit lion in Tanzania by:

- Paying for conservation programs;
- Paying for anti-poaching programs, personnel, and equipment;
- Providing direct contributions from safari operators to anti-poaching patrols and scouts, and providing early detection and reporting of poaching incidents, all of which benefits the government by shifting these costs to the private sector;
- Increasing habitat and reducing lion-human conflict by benefiting local communities through Tanzania's growing Wildlife Management Areas (WMAs), including by

disbursing 75% of the block fee and 70% of the permit fee to WMAs once it is paid by the concessionaire; and

- Justifying the preservation of most wildlife habitat and helping fund its management.

Table 12: Trend of revenue generated from Safari hunting and photographic tourism accrued to the Wildlife Division/TWPF*

Financial Year (July/June)	Safari hunting	Photographic Tourism(Areas under jurisdiction of WD)
2009/2010	18,444,881.00	2,706,603.00
2010/2011	23,536,347.00	2,863,287.24
2011/2012	15,062,217.75	2,080,978.00
2012/2013	15,917,430.93	3,904,808.35
2013/2014	16,723,425.00	5,016,703.03
2014/2015	16,277,373.00	4,736,187.00
2015/2016*(until May 2016)	12,066,774.00	4,004,038.00

*In US Dollars

75% of the game fees are retained by Treasury and 25% by the Wildlife Division (TWPF); of the 75% collected by Treasury, 25% is sent to District Councils where the hunt took place. The District Council (DC), under current administrative procedures, use 60 % of this sum for communities' development projects and 40% for anti-poaching activities.

Treasury reassign part of the revenues to the Ministry during the annual budget exercise.

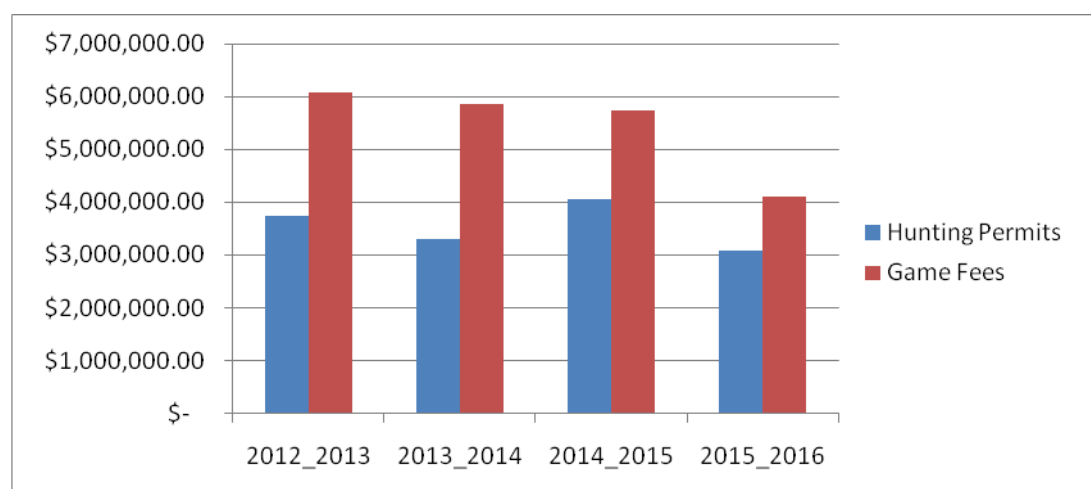
Once fully operational, the Tanzania Wildlife Management Authority (TAWA), will retain 100% of the hunting revenues, thereby changing the above mentioned system. At present there is a transition period and TAWA should be fully operational in the second half of 2016.

All the transactions are retrievable from the electronic permitting system (described in section 4.5).

The Selous Game Reserve is working under a special retention scheme whereby 50% of the revenues are retained by the Game Reserve.

A partial breakdown of the figures in Table 12 is given in Tables 13 and 14

Table 13 Revenues generated from Hunting permits and game fees



Revenues generated from Hunting Blocks varies depending of their categories. The following table 14 shows the revenues generated by hunting blocks fees:

Table 14 Revenues generated from Hunting Blocks

2013/2014	2014/2015	2015/2016
\$4,295,000.00	\$4,684,000.00	\$4,279,000.00

A lion hunting license includes several fees, described in the Schedules of the Tourist Hunting Regulations of 2015. In particular, the Third Schedule regarding Game Fees values a lion hunt at 4,900 US\$(rifle) and 6,125 US\$ (bow). The Fifth Schedule applies to a lion hunt as a i) 21-day safari Permit Fee at 1,000 US\$ (rifle) and 2,000 US\$ (bow), a ii) conservation daily fee at 150 US\$ per hunter (\$150 x 21 = \$3,150), and 100 US\$ per observer fees (\$100 x 21 = \$2,100), and a iii) trophy handling fee at US\$ 500.

The total of these fees per lion is a minimum of 9,550 US\$ to 11,775 US\$, excluding the observer fee (2,100 US\$ for a 21 days' safari. Adding that would total 11,650 US\$ to 13,875 US\$ for each lion.

Lion Safari hunting is central in Tanzania, certainly being the major draw that attracts hunting clients to the country. Twenty-one days' hunting permits includes lion in 50-60% of the cases. Even though lions are not always harvested, the hunter pays for the associated fees and spends money on other fees, which generates income for conservation activities. Twenty-one days' safaris are the greatest generators of revenues from hunting in Tanzania and are required by the Hunting Regulations for lion and elephant.

Table 15: Total number of Hunting Permits per Package from 2012 to 2015

Package	Fee (for rifle. Bow different) IN USD	FY2012-2013	FY2013-2014	FY2014-2015	FY2015-2016
7 DAYS	1,250	0	25	47	29
10 DAYS	1,200	202	163	142	129
14 DAYS	1,100	0	25	36	27
16 DAYS	1,000	28	0	0	0
21 DAYS	1,000	558	479	494	375
28 DAYS	900	0	19	20	9
TOTAL		788	711	739	569

Table 15 provides a breakdown of the total number of Hunting permits per Package. For each Package a fee is paid in accordance with the Fifth Schedule of the Tourist Hunting Regulations.

11.1 Revenue from US hunters specific to lions

In section 7.1 we presented data on lion harvests for Safari hunting over the past eight years in Tanzania.

Here we present specific data on lion harvests by US citizens and their contribution to conservation activities in Tanzania.

The United States of America represents the most important single country market for Safari hunting in Tanzania. For example, in 2015, out of a total number of 569 permits to all nationalities (see table 15),242permits were issued to US clients, representing 42.5% of the permits issued. Of these permits, U.S. hunters booked 202 21-day safaris. These U.S. clients generated in FY 2015/2016 (up to January 2016, FY ends June 2016) an approximate

revenue for the WD of \$ 3,507,000 in permits fees (conservation, observer, trophy handling and package) and game fees.

Table 16 represents the minimum revenue accrued to the Wildlife Division from US hunters and does not include for example the observer fee (USD100 a day i.e. 2100 USD for a 21 days' safari). Moreover, many hunters book a 21 day safaris which include lion paying the respective 9,550 US\$ fees without harvesting a lion. Taking into account the figures in table 17 and the fact that more than 50% and up to 60% of the 21 days' safaris requested a lion, calculations can be made of the revenues generated from hunting permits which includes a lion. Finally, the contribution of the US hunters for lion harvesting is much higher than represented in this table. If all revenues and costs are included, such for example block fees and professional hunter fees, the contribution will increase exponentially.

Table 16: Lions harvested by US citizens 2012-2015 and minimum revenue accrued to the Wildlife Division

Year	Number of Lion Harvested by Hunters from the USA	Minimum Revenue US\$ Per Lion*	Total US\$
2012/13	30	\$ 9,550.00	\$286,500.00
2013/14	27	\$ 9,550.00	\$257,850.00
2014/15	23	\$ 9,550.00	\$219,650.00
2015/16	19	\$ 9,550.00	\$171,900.00
Total	99		\$ 935,900.00

*Revenue includes only the following; Permit fee, Conservation fee, Game Fee, Trophy handling fee.

Table 17 shows the blocks where lions were harvested by US hunters from 2012 to 2015

Table 17 Blocks where Lions have been harvested by US citizens 2012-2015

Species	Block	FY 2012/2013	FY 2013/2014	FY 2014/2015	FY 2015/2016
LION	BURUNGE GAME CONTROLLED AREA	1			
LION	CHUNYA OPEN AREA (WEST)	1			
LION	INYONGA GAME CONTROLLED AREA (WEST)	1			
LION	INYONGA GCA C		1		
LION	INYONGA GCA E				2
LION	KITWAI GCA SE			1	
LION	KIZIGO GAME RESERVE (CENTRAL)	1			
LION	KIZIGO GAME RESERVE (EAST)	3			
LION	KIZIGO GAME RESERVE (WEST)	2			
LION	KIZIGO GR C		1	1	1
LION	KIZIGO GR W		1		1
LION	KUKWATI GAME CONTROLLED AREA (SOUTH)	2			
LION	LAKE RUKWA GCA			1	
LION	LOLKISALE GAME CONTROLLED AREA	1			
LION	LUGANZO GAME CONTROLLED AREA	1			
LION	LUKWATI GAME CONTROLLED AREA (NORTH)	1			
LION	LUKWATI GR N		1	1	1
LION	LUKWATI GR S		2	2	1
LION	LUNDA NKWAMBI GCA N		1		1
LION	MASWA GAME RESERVE (NORTH)	2			
LION	MASWA GR (N)		1		
LION	MASWA KIMALI GR		1		
LION	MASWA MBONO		1		
LION	MBARANGANDU OPEN AREA	1			
LION	MOYOWOSI GR S		1		
LION	MOYOWOSI/NJINGWE GR 2			2	1
LION	MOYOWOSI-NJINGWE GR 3			1	1
LION	MSIMA GAME CONTROLLED AREA (WEST)	1			
LION	MSIMA GCA E		2	1	
LION	MSIMA GCA W			1	
LION	MUHESI GR W			2	1
LION	RUNGWA IKILI GR			1	
LION	RUNGWA INYONGA GR		1	1	
LION	RUNGWA MPERA GAME RESERVE	1			
LION	RUNGWA MPERA GR		2	1	
LION	RUNGWA MZOMBWE OA		2	1	
LION	RUNGWA OA S				1
LION	RUNGWA RIVER GAME CONTROLLED AREA	1			
LION	RUNGWA RUNGWA GR (E)		2	1	1
LION	RUNGWA RUNGWA GR W		1		1
LION	RUNGWA-MZOMBE OPEN AREA (WEST)	3			
LION	SELOUS GAME RESERVE BLOCK LU2	1			
LION	SELOUS GAME RESERVE BLOCK RU1	1			
LION	SELOUS GAME RESERVE LU4	1			
LION	SELOUS GR K1	1			
LION	SELOUS GR LL1				2
LION	SELOUS GR LR2			1	
LION	SELOUS GR LR3		1		
LION	SELOUS GR LU1-LU2		1		1
LION	SELOUS GR LU7			1	
LION	SELOUS GR MA1			1	
LION	SELOUS GR MB2			1	
LION	SELOUS GR MHJ3				2
LION	SELOUS GR MS1				1
LION	SELOUS GR N1		2		
LION	SIMANJIRO KITIANGARE GCA			1	
LION	UGALLA GR E		2		
LION	UGUNDA GAME CONTROLLED AREA	2			
LION	WEMBERE GAME CONTROLLED AREA (SOUTH)	1			
	TOTAL	30	27	23	19

Although no lion was hunted in WMAs, at least by US hunters, WMAs are benefitting from 21 days' safaris through the intercompany hunting arrangement. As defined in section 19 of the Tourist Hunting Regulation 2015 "intercompany hunting" means a situation where the Director of Wildlife has issued an additional hunting permit to a hunting company to conduct hunting in a hunting block belonging to another company for the purpose of enabling a hunting client to obtain species not hunted in its allocated hunting block.

Moreover, lions are harvested in GCAs and OAs thus bringing benefits to communities and alleviating HLC.

11.2 Expenditures by Wildlife Division

The revenues obtained by the different hunting fees from tourist hunters are invested in the operational costs of the protected areas which are under the jurisdiction of the Wildlife Division.

Not only Lion hunting contributes an important percentage to the operational costs (e.g. salaries of anti-poaching personnel, allowances, fuel, health care etc.) of Game Reserves and other hunting areas, but, as indicated in the previous section, it is the main driving species for the booking of 21 days Safaris that are one of the main revenue generators for the WD and the hunting sector.

Funds are distributed by TWPF to 17 Outstations and 8 Zonal Antipoaching Units (ZAPU) as shown in Table 18 that includes Ration Allowances, Drugs and Medicine, Domestic Per Diem, Diesel, Petrol Prosecutions, Casual Laborers, Utility, Motor Vehicles and Water Craft.

The table do not include additional funds distributed as Responsibility Allowances for Head of Station, Projects, and funds for other departments, that represent and additional expenditure also derived from hunting revenues.

Pasiansi Wildlife Training Institute, Likuyu-Sekamanga CBNR Institute and Selous Game Reserve have their own budgets and operates, in part, from funds distributed by TPWF, derived to a great extent from hunting revenues.

All budgets are available upon request.

Table 18. DISTRIBUTION OF FUNDS TO OUTSTATIONS FROM 2012 to 2016 (per Fiscal year) in TZS

Fiscal Year	Amount in TZS	Approximate amount in USD*
2012-2013	1.987.607.442,00	1,242,254
2013-2014	2.631.058.996,00	1,644,411
2014-2015	2.865.194.516,00	1.637,254
2015-2016(partial)	3.828.804.616,00	1,823,240

- Calculated at an average historical rate of exchange. (1USD=1600TZS for 2012-2013 and 2013-2014, 1 USD=1750 TZS for 2014-2015 and 1USD=2100TZS for 2015-2016).

The Wildlife Division is committed to introduce in the budget for the next Fiscal Year 2016-2017 (starting in July), which is in preparation now, a budget line to cover the costs of the lion aging system and of at least one survey from the hunting fee revenues.

12. Conclusions and Non-Detriment Findings

Tanzania is guided by four main principles in its conservation activities:

- Responsibility principle - Responsibility to use resources in an ecologically sustainable, economically efficient and socially just manner
- Precautionary principle - The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures
- Adaptive management principle - Learning-by-doing
- Participatory principle - The importance of full stakeholder participation in the formulation and implementation of decisions

Tanzania has implemented in recent years a series of recommendations deriving from scientific literature to address the management of Safari hunting and enhance its contribution to lion conservation, bearing the responsibility of having the biggest wild lion population in Africa and on Earth.

These include recommendations formulated by various authors (Whitman et al. 2004, 2007; Packer et al. 2006; Palazy et al. 2011; Hunter et al. 2013; Lindsey et al. 2013; and Bauer et al. 2015), and specifically recommendations on the implementation and enforcement of age restrictions (6 years or older); improved, independent trophy monitoring and adaptive management of quotas; implementation of maximum quotas to prevent excessive harvests, until age restrictions and trophy monitoring are in place (Tanzania is even stricter, having maintained and reduced its quota even though age restrictions and trophy monitoring are in place); restriction of harvest to males; and a minimum length of lion hunts of at least 21 days (to allow time for selection and to maximise revenues) fixed- quotas which encourage over-harvest; lack of age restrictions; and hunting of females.

At present, Safari hunting has a very insignificant impact on the lion population and it is not a threat contributing to their potential decline. On the contrary it plays a significant role in maintaining ecosystems, protecting species against illegal activities and providing tangible benefits to Tanzania's economy and the livelihoods of Tanzania's rural people.

Lion Safari hunting is central in Tanzania, certainly being the major draw that attracts hunting clients to the country. Lion trophies are asked for in more than half of the hunting permits yearly issued. The United States of America (U.S.) represents the most important market for Safari hunting in the Tanzania with more than 40% of clients coming from US.

In Tanzania, wildlife conservation is at first hand a matter of land use. Proclaimed protected areas gazetted as hunting areas (304,399.95 km²) are ca. 5 times larger than protected areas without safari hunting activity (57,838 km²). Protected areas gazetted as hunting areas cover about one third of the country and serve as prime reservoirs of global biodiversity, securing maintenance of natural ecosystems and prey base for lions.

Human population in Tanzania has significantly increased since 1950 (i.e. 7 million in 1950 against 46 million in 2011) and is projected to increase by 500 per cent or more by 2100 (United Nations, 2011). During 2011-2100, six countries are expected to account for half of the world's projected population increase, with Tanzania being among them (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.

Financial resources for conservation, particularly in developing countries such as Tanzania, are limited. As such, consumptive (including Safari hunting) and non-consumptive (photo tourism safaris) uses are both needed to generate funding. Without these, many natural habitats would otherwise be converted into agricultural or pastoral uses, producing inevitable habitat loss.

The Safari hunting sector's sustainability would be threatened by the loss of its main attracting product (the lion) combined to the loss of its main market (the USA). A lot of hunting companies operating will return most (if not all) of their hunting areas to the Wildlife Division to avoid bankruptcy. As a consequence, many protected areas devoted to safari hunting will be converted to agro-pastoral land, leading to the unavoidable extinction of wildlife and natural habitats with collapse of ecosystem services. This negative consequence is that the WD seeks to avoid and is a powerful reason to support regulated, sustainable safari hunting in Tanzania. It is clear, based on the data collected here, that safari hunting in Tanzania benefits the lion by mitigating the primary threats to the lion.

In this document consideration has been given to the population of lion in Tanzania; the quota-setting system which recognizes the scientific formulated thresholds of 1lion/1000km² in high density areas and 1lion/2000km² in low density areas and the consequent current precautionary quota of 200 lions; the National Carnivore Action Plan; the well developed and implemented age-based harvest policy; the limited harvest and the incentives to conservation represented by the substantial revenues generated by safari hunting for Wildlife Division operations, anti-poaching, and community development. The Scientific Authority has considered the current threats to lion, including loss of habitat and human-lion conflicts, and potential of safari hunting to mitigate those threats.

Safari hunting provides a net benefit to the species, it does not pose a threat to the species, and it is not a detriment to the survival of the species. Regulated safari hunting of lion in Tanzania enhances the survival of the species. Lion is neither endangered nor threatened in Tanzania.

The United Republic of Tanzania expects CITES Parties to implement CITES Resolution Conf. 2.11 with particular reference to paragraph b) that states: *"in order to achieve the envisaged complementary control of trade in Appendix-I species by the importing and exporting countries in the most effective and comprehensive manner, the Scientific Authority of the importing country accept the finding of the Scientific Authority of the exporting country that the exportation of the hunting trophy is not detrimental to the survival of the species, unless there are scientific or management data to indicate otherwise"*.

Upon considering all the factors illustrated in this document and in accordance with Article IV of CITES and CITES Resolution Conf.16.7, the Scientific Authority of Tanzania has advised the Management Authority that the low level of off-take generated by safari hunting is not detrimental to the survival of the lion in Tanzania and enhances its survival and the amount of revenues generated by this low level of off-take are of crucial importance for the conservation of the species also because of the benefits it provides to rural communities.

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APPENDIX 1 Assessment of the Enhancement and Non-Detriment Findings against the IUCN SSC “Guiding principles on trophy hunting as a tool for creating conservation incentives. Ver. 1.0. IUCN SSC (2012)”

An assessment of the Enhancement and Non-Detriment Finding on Lion in Tanzania against the IUCN SSC GUIDING PRINCIPLES ON TROPHY HUNTING AS A TOOL FOR CREATING CONSERVATION INCENTIVES. VER. 1.0. IUCN SSC (2012), was done by the Wildlife Division and TAWIRI in recognition of the importance of the implementation of these principles to be applied as a guidance to manage trophy hunting as a legal, regulated conservation activity which provides a critical tool to secure a sound social, economic and ecological conservation scenario.

Biological Sustainability

Trophy hunting* can serve as a conservation tool when it:

#	Principle	Remarks
1	Does not contribute to long-term population declines of the hunted species or of other species sharing its habitat, noting that a sustainably harvested population may be smaller than an unharvested one	<p>Safari hunting has an insignificant impact on the lion population in Tanzania because the offtake is limited and low. It is not a threat contributing to the population’s potential decline.</p> <p>Tanzania sets its lion quota in accordance with sustainable limits (e.g., 1 lion/2,000 km²for normal density or 1 lion per 1,000 km²for high density areas, see Packer et al. (2011)).</p> <p>Considering the latest available estimate of lion population size in Tanzania (i.e. 16,800; Mésochina et al. 2010), trophy hunting harvested a yearly mean of 1.34% (min: 0.53%; max: 2.46%) of lion males ranging in the country, for the past eight years. This figure is considered as low and has decreased since the establishment of age restriction rules on lion hunting, i.e. Tourist Hunting Regulations of 2010.</p> <p>This low offtake is sustainable and generates significant financial and other benefits.</p>
2	Does not substantially alter processes of natural selection and ecosystem function; that is, it maintains “wild populations of indigenous species with adaptive gene pools.” This generally requires that hunting offtake produces only minor alterations to naturally occurring demographic structure. It also requires avoidance of breeding or culling to deliberately enhance population-genetic characteristics of species subject to hunting that are inconsistent with natural selection	<p>Safari hunting in Tanzania does not substantially alter natural selection or ecosystem processes. Tanzania’s limited quota, as further limited by age restrictions, ensures that hunting offtakes do not negatively affect natural processes. This age-based policy was adopted in part to mitigate any social or population impacts from limited safari hunting. (Whitman et al. 2004).</p> <p>Tanzania maintains a large wild lion population (approximately 16,800 (Mesochina 2010)) across a wide permanent and transient range, which contributes to an adaptive gene pool. No captive breeding or breeding for specific characteristics is done for lion in Tanzania.</p>
3	Does not inadvertently facilitate poaching or illegal trade of wildlife	<p>Safari hunting in Tanzania does not inadvertently facilitate poaching or illegal trade. Poaching and illegal trade in lion products is</p>

		<p>currently very low in the country, which suggests that the existence of licensed, regulated hunting is help control poaching and not facilitating it.</p> <p>Hunting operators are in the frontlines against poaching. Concession lease agreements require assistance with anti-poaching. Operators spend significant resources on this and must submit annual reports to the Wildlife Division documenting their efforts. Even where anti-poaching is not a legal prerequisite, operators fund their own anti-poaching teams and support government rangers and community scouts.</p>
4	<p>Does not artificially and/or substantially manipulate ecosystems or their component elements in ways that are incompatible with the objective of supporting the full range of native biodiversity</p>	<p>Hunting in Tanzania does not manipulate ecosystems in ways that are incompatible with supporting biodiversity. To the contrary, hunting has created financial incentives for the development and retention of wildlife as a land use across an area of 300,400 km², where hunting is a primary land use. Hunting areas serve as buffer zones for many national parks. The abandonment of safari hunting as a land use option would put at risk an enormous amount of land that provides habitat for diverse species, at least 44,000 km² would be at risk of conversion to other land uses. That is over three-quarters the area of Tanzania’s national parks, and is roughly the same amount of area as Kenya’s national parks and reserves. (WDPA 2016).</p>

Net Conservation Benefit

Trophy hunting can serve as a conservation tool when it:

#	Principle	Remarks
1	<p>Is linked to identifiable and specific parcels of land where habitat for wildlife is a priority (albeit not necessarily the sole priority or only legitimate use); and on which the “costs of management and conservation of biological diversity [are] internalized within the area of management and reflected in the distribution of the benefits from the use”</p>	<p>Hunting in Tanzania is linked to identifiable land areas where providing habitat and sustaining wildlife populations is a priority. Protected areas gazetted as hunting areas (304,400 km²) are ca. 5 times larger than protected areas without safari hunting activity (57,838 km²). Protected areas gazetted as hunting areas cover about one-third of Tanzania and serve as prime reservoirs of global biodiversity, securing maintenance of natural ecosystems and prey base for lions.</p> <p>Hunting areas include 28 Game Reserves, 44 Game Controlled Areas, 38 Wildlife Management Areas and 57 Open Areas subdivided in 196 Hunting Blocks.</p>

		<p>As much as possible, the costs and benefits of management and conservation are localized. A realistic estimate of costs of management incurred by hunting companies on a yearly basis ranges from \$300,000 to \$500,000 per block, which includes the expense of camps, salaries, anti-poaching, fuel, community assistance, etc. Many of the government's costs of maintaining Game Reserves and Game Controlled Areas are transferred to the private sector through private anti-poaching units or contributions towards government rangers and equipment.</p> <p>Further, revenues from hunting are used for anti-poaching, block maintenance and development, and contributions to communities living nearby. In WMAs, which are community-controlled lands, the majority of fees goes to the community, as directed by the Tourist Hunting Regulations (2015). Much of the revenue generated also goes to the communities pursuant to negotiated payments, employment, and voluntary contributions by hunting operators. In hunting areas in particular (as compared to the national parks), the costs and benefits of wildlife in the area are internalized and distributed within the area of management.</p>
2	<p>Produces income, employment, and/or other benefits that generate incentives for reduction in pressures on populations of target species, and/or help justify retention, enhancement, or rehabilitation of habitats in which native biodiversity is prioritized. Benefits may create incentives for local residents to co-exist with such problematic species as large carnivores, herbivores competing for grazing, or animals considered to be dangerous or a threat to the welfare of humans and their personal property</p>	<p>Hunting produces direct and indirect income, employment, and other benefits that generate incentives that reduce the threats to wildlife populations in Tanzania.</p> <p>In the period from 2006 to 2013, approximately \$115 million accrued to the Wildlife Division from the revenues of trophy hunting. This revenue pays for the daily wildlife conservation work in Tanzania, including research projects, surveys, anti-poaching, and other services. Nearly 80% of the Wildlife Division/TWPF's anti-poaching budget comes from hunting revenue.</p> <p>Hunting generates income for local communities organized as WMAs, which lease the habitat and receive lease payments and revenue and fee shares, as well as voluntary contributions and meat. In 2014, lease payments from hunting operators alone generated \$612,000 in revenue for WMAs.</p> <p>Thousands of people are employed in the hunting sector on a permanent basis and many more on a seasonal basis. In just 2014 and 2015 alone, hundreds of new rangers have been employed.</p> <p>Wild areas of Tanzania provide biodiversity services, i.e. ecosystem services, through the</p>

		<p>provision of recreational opportunities such as hunting and the aesthetic enjoyment of the wildlife that utilize these landscapes.</p> <p>Safari hunting plays an important role in the ecosystem services as defined in the Millennium Ecosystem Assessment (MA) (2005), i.e. "the benefits people obtain from ecosystems." Safari Hunting is both a provisioning and cultural service (two of the four categories) of services identified by the MA.</p> <p>The Safari hunting system in Tanzania where operators pays fees and other payments to encourage ecosystem and species conservation, and rural livelihoods, could be considered as a Payment for Ecosystem Services (PES). Its contribution in this regard and in the whole framework of Ecosystem Services shall be analysed further and it is the intention of the Wildlife Division to start working on this subject as a priority.</p>
3	<p>Is part of a legally recognized governance system that supports conservation adequately and of a system of implementation and enforcement capable of achieving these governance objectives</p>	<p>Wildlife species in Tanzania, including African lion, are protected under the Wildlife Conservation Act No.5 of 2009. This Act protects the species' natural habitat and prey, primarily through a network of protected areas and limits on offtake of listed species. The Act is implementing through the Wildlife Conservation regulations. Safari hunting is regulated by the Wildlife Conservation (Tourist Hunting) Regulations updated in 2015.</p> <p>In areas that allow hunting, the Act and Regulations are implemented by the Wildlife Division and the newly operational Tanzania Wildlife Authority (TAWA). Funding comes from the Tanzania Wildlife Protection Fund.</p> <p>District Councils are responsible for setting wildlife management and conservation policy in WMAs, as overseen by the WD.</p> <p>These entities, along with the entities that oversee strictly protected areas such as TANAPA and the NCAA and scientific entities such as TAWIRI, are responsible for implementing the Lion and Leopard Plan. They are all overseen by and report to the MNRT.</p>

Socio-Economic-Cultural Benefit

Trophy hunting can serve as a conservation tool when it:

#	Principle	Remarks
1	Respects local cultural values and practices (where “local” is defined as sharing living space with the focal wildlife species), and is accepted by (and preferably, co-managed and actively supported by) most members of the local community on whose land it occurs	<p>The Tourist Hunting Regulations require safari operators to contribute no less than \$5,000 per year to the communities within and adjacent to their concessions. Operators discuss with the villages how to use the contributions and work with the villages to implement community and infrastructure development and projects.</p> <p>There are currently 21 gazetted Wildlife Management Areas (WMAs) in Tanzania and the majority of these WMAs depend on Tourist Hunting as the only viable investments currently supporting conservation work and community development services.</p> <p>Employment ventures for local communities enable them to meet basic needs at household and community levels. These opportunities are provided by investors also in the hunting sector and WMA Associations.</p>
2	Involves and benefits local residents in an equitable manner, and in ways that meet their priorities	<p>WMAs represent the community based conservation system of Tanzania and they are seen as a key component of rural development and as one of the best weapons in the fight against illegal utilization. WMAs provide enhanced protection of critical habitats outside of protected areas and represent the best hope for conserving wildlife outside of Tanzanian protected areas while enhancing rural economic development through consumptive and non-consumptive use investments. In 2012 the regulations governing WMAs were revised to increase benefits-sharing and to vest communities with greater rights to negotiate the leases and elect the safari operators who will oversee the WMA concessions</p> <p>That WMAs benefit local communities is demonstrated by the current registration of 21 WMAs, the pending registration of another 17 WMA and continued enquiries from communities about becoming gazetted.</p>

3	Adopts business practices that promote long-term economic sustainability	<p>For the first time in 2013, WMAs has received the power to sign utilization contracts with the private sector (consumptive and non-consumptive). These arrangements which will last for five years (2018) have enabled WMAs and therefore the villages and people living there to sign contracts with hunting operators worth more than USD 4.3 million.</p> <p>The approval of the WMA implementation strategy streamlines the processes to strengthen CBRNM in Tanzania.</p> <p>Long-term economic sustainability of community based programs involving trophy hunting depends also on the international framework on trade as international trade restrictions can jeopardize conservation programs.</p>
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Adaptive Management: Planning, Monitoring, and Reporting

Trophy hunting can serve as a conservation tool when it:

#	Principle	Remarks
1	<p>Is premised on appropriate resource assessments and/or monitoring of hunting indices, upon which specific quotas and hunting plans can be established through a collaborative process. Optimally, such a process should (where relevant) include local communities and draw on local/indigenous knowledge. Such resource assessments (examples might include counts or indices of population performance such as sighting frequencies, spoor counts) or hunting indices (examples might include trophy size, animal age, hunting success rates and catch per hunting effort) are objective, well documented, and use the best science and technology feasible and appropriate given the circumstances and available resources</p>	<p>Licensed, regulated hunting in Tanzania is permitted under an adaptively set quota system. Quotas are set using monitoring data and input from a variety of stakeholders including the Wildlife Division, TAWIRI, government rangers and scouts, local communities, hunting operators, and field biologists. Quotas are set based on population estimates or trend analyses, monitoring data, hunt return data, research work and indices as may be reflected in various reports by field personnel.</p> <p>For lion specifically, following consultations with the Scientific Authority (TAWIRI), the CITES Management Authority (WD) has decided to introduce a new export quota for lion hunting trophies of 200 specimens. This will be effective at the start of the next hunting season, commencing in 1st July 2016.</p> <p>This new quota is (i) a reduction of one third of the previous quota and (ii) 25% below the sustainable harvest level suggested by the CITES Scientific Authority (TAWIRI) and Packer et al. (2011), i.e. 1 lion/2000Km² for most hunting areas, and 1 lion/1000Km² for the Selous Game Reserve and other high density areas, and taking into account the lion range in Tanzania (permanent presence range for lion of 516,900 km², and a temporary presence range of 232,800 km²).</p> <p>The new quota is a further precautionary measure, complementing the strict age restriction regulation implemented since the entry into force of the</p>

		<p>Tourist Hunting Regulations of 2010. It is a three tier limit, i.e., age, number per square kilometer, and maximum overall number. It made sense to the Management Authority to reduce the quota because the prior quota was never utilized fully, and the lower maximum level of offtake demonstrates Tanzania's commitment to sustainable hunting.</p>
2	<p>Involves adaptive management of hunting quotas and plans in line with results of resource assessments and/or monitoring of indices, ensuring quotas are adjusted in line with changes in the resource base (caused by ecological changes, weather patterns, or anthropogenic impacts, including hunting offtake)</p>	<p>Quotas are set adaptively in line with the results of monitoring. Further, quotas for lion are also managed based on regulatory compliance. If an underage lion is harvested, the quota for that area is reduced in the next season to allow the population to age and to penalize the non-compliance. In this way, Tanzania ensures responsible and sustainable offtakes that have limited impact on the lion population.</p> <p>Quotas are reviewed by the Quota Allocation Advisory Committee, comprised of wildlife conservation experts from TAWIRI, the University of Dar es Salaam, Sokoine University of Agriculture, University of Dodoma, the College of African Wildlife Management, and the Wildlife Division. The Committee provides a second review of the quota setting, which doubly ensures the sustainability of the offtakes.</p>
3	<p>Is based on laws, regulations, and quotas (preferably established with local input) that are transparent and clear, and are periodically reviewed and updated</p>	<p>Safari hunting in Tanzania is regulated through the Wildlife Conservation Act no.5 of 2009 and a number of Regulations among which the principal one is the Tourist Hunting Regulations recently amended in 2015. As described above. quotas are established in a transparent and participatory way.</p>
4	<p>Monitors hunting activities to verify that quotas and sex/age restrictions of harvested animals are being met</p>	<p>The monitoring of the lion hunting is carried out through the implementation of a specific database and a specific safari return form. Based on all hunting permits issued by (and compulsorily returned to) the Wildlife Division, a specific database has been set up to record lion hunting harvests. Regularly updated, the database is used to follow-up lion Safari hunting activity and trophy skulls that must be presented to the Wildlife Division for inspection.</p> <p>Since mid-August 2011, 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 Safari hunting success are collated. For the successful lion hunting safaris, additional information like the hunting effort, specific measurements (total length and</p>

		<p>shoulder height) and specified photographs are taken. Safari return forms and trophy photographs are compulsorily provided by the hunting companies to the Wildlife Division. No CITES export permit can be issued without compliance.</p> <p>All offtakes are reviewed by the CITES Scientific Authority (TAWIRI) to ensure the offtakes and subsequent exports are not detrimental to the survival of the species.</p> <p>Also operators are required to submit annual reports on the status of the concessions, anti-poaching, community and block development, and other matters to the Wildlife Authority. These reports are used to assess compliance with the Wildlife Conservation Act and the Tourist Hunting Regulations. Operators are required to submit three-year reports to the Wildlife Division to assess their compliance with the requirements of their leases and evaluate whether the concession lease should be renewed.</p> <p>A database of all hunting permits issued by (and compulsorily returned to) the Wildlife Division is used to follow-up lion trophy hunting activity and trophy skulls that must be presented to the Wildlife Division for inspection. When a permit is sought, the system deducts the number of animal hunted from the quota uploaded. The system indicates the quota balance from each animal species. In this regard, over utilization of the hunting quota issued to a company is controlled, and tracked on the harvest end through the hunt return forms.</p> <p>Tanzania also requires that a government ranger must observe all longer safaris for the larger species.</p>
5	<p>Produces reliable and periodic documentation of its biological sustainability and conservation benefits (if this is not already produced by existing reporting mechanisms).</p>	<p>The Wildlife Subsector Statistical Bulletin is published every three years and contains important information on conservation activities of the Wildlife Division including Hunting. TAWIRI produces regularly scientific reports and NDFs. Reporting to CITES is done periodically.</p>

Accountable and Effective Governance

A trophy hunting programme can serve as a conservation tool when it:

#	Principle	Remarks
1	Is subject to a governance structure that clearly allocates management responsibilities	Tanzania's governance structure is described in the Wildlife Conservation Act No.5 of 2009 and its subsidiary regulations that clearly provides for Institutional arrangements and administration defining the management responsibilities within the relevant Government Authority.
2	Accounts for revenues in a transparent manner and distributes net revenues to conservation and community beneficiaries according to properly agreed decisions;	<p>The Wildlife Policy stresses the need for equitable distribution of costs and benefits that considers stakeholders' role in relation to categories of land and efforts invested by the institution in conservation within WMAs. The improvement of benefit sharing arrangements as an incentive to local Communities to conserve wildlife is taking place.</p> <p>Governmental institutions such as TPWF distribute revenues to conservation and community beneficiaries and supports infrastructure development and direct cost for carrying anti-poaching activities in Zonal Anti-Poaching Units (ZAPUs). As a mechanism of providing incentives to the communities in districts that participate in wildlife conservation, TWPF supports community development projects such as building of schools upon screening of submitted proposals based on the stipulated criteria in TWPF guidelines for funding.</p> <p>Safari operators contribute substantially and voluntarily, above the prescribed fixed contribution, to Tanzania's enhanced anti-poaching efforts and communities' development. They provide funding, equipment and the technical expertise for repairs, transportation, and most critically, funding for government game scouts as well as their own anti-poaching patrols. Hunting Companies' anti-poaching teams acting in collaboration with the Wildlife Division Anti-Poaching Units, remove snares, prevent illegal logging, and arrest poachers in a coordinated and continuous effort.</p>
3	Takes all necessary steps to eliminate corruption;	<p>Several legislations and initiatives are in force in Tanzania to combat corruption including:</p> <p>Prevention and Combating of Corruption Act No. 11 of 2007 The Public Procurement Act, Act 21 of 2004 The Public Services Act, Act 8 of 2002 The Public Finance Act, 2001 The Ethical Codes for Public Officials</p> <p>The 2016 Anti- Corruption Summit was hosted by the British Prime Minister, David Cameron and</p>

		<p>was held on 12th May, 2016 in London-UK to set up global action to expose, to punish and to drive out corruption in all walks of life. The Summit stirred up the global response in tackling corruption by jointly agreeing to deal with corruption across borders.</p> <p>Among African Heads of state invited was President of the United Republic of Tanzania Dr. John Pombe Magufuli who was represented by the Tanzania Prime Minister, Kassim Majaliwa.</p> <p>The Tanzania Prime Minister presented country Anti-Corruption Commitments and urged that Corruption is a serious crime that needs concerted efforts.</p>
4	<p>Ensures compliance with all relevant national and international requirements and regulations by relevant bodies such as administrators, regulators and hunters.</p>	<p>The CITES Management Authority of Tanzania, the MNRT Wildlife Division, ensures compliance of safari hunting to CITES provisions.</p>

APPENDIX 2 - Reference Table to the USFWS Letter and Questionnaire on Lion in Tanzania

The attached table cross-references the sections of the Enhancement and Non-Detriment Findings with the questionnaire directed to the Wildlife Division from the USFWS, dated 15 April 2016.

<i>Question</i>	<i>Responded to in Section(s)</i>
<i>I. OVERVIEW</i> <i>The lion is listed in Appendix II of CITES. As such, the Scientific Authority of the exporting country must make a determination that the export of a sport-hunted trophy will not be detrimental to the survival of the species (Article III, 2(a)). While the finding that the U.S. Fish and Wildlife Service must go beyond the “Non-detriment” standard, it would be very beneficial to our review if you could provide a copy of a recent “Non-detriment” finding made by your Scientific Authority.</i>	
<i>II. MANAGEMENT PLAN (a comprehensive plan addressing specific management goals or actions)</i>	
<i>1. Does Tanzania currently have a national management plan for lions and, if so, could you please provide a copy? If there is no national plan, have regional plans been developed and adopted, and if so, could you please provide copies?</i>	8.1.
<i>2. Is your agency the only government agency that is responsible for managing lions within your country? If not, which other agency or organization within your national, regional, or local government is responsible?</i>	8.1
<i>3. Have you developed a mechanism (i.e., adaptive management approach) for implementing the plan(s) and determining its effectiveness? Could you describe how implementation of the plan is progressing and if there are management or logistical problems that still need to be addressed?</i>	8.1
<i>4. Are there any other management plans or conservation plans that contribute to or interact with the lion management plan(s) (i.e., regional plans, hunting concession plans)?</i>	8.1
<i>III. POPULATION STATUS</i>	
<i>1. What is the status of lion populations within your country (e.g., population numbers; population trends; sex and age classification)?</i>	3
<i>2. Do you have a standardized process to conduct population censuses? If so, how often? What areas are censused? Do they include all hunting areas? What is the censusing methodology?</i>	3
<i>3. What is the current distribution of lions within your country (i.e., widespread, environmentally confined to specific areas, confined to national or regional protected areas)?</i>	2 and subsections
<i>4. Even with protection activities and legal intervention, poaching could still occur. Do you have any estimates on the number of specimens lost to illegal killing annually?</i>	9 and subsections
<i>5. What impact are human-lion conflicts having on local or national populations? Is there a standardized national policy to address such conflicts and problem lion control? If so, does this policy include culling</i>	9.1

<i>of surplus animals and removal of nuisance animals? Is there domestic harvesting of lions for local consumption or use?</i>	
IV. CONSERVATION AND MANAGEMENT	
<i>1. Please describe potential threats to the species, such as poaching and human-animal conflicts, and how these threats are being addressed.</i>	9 and subsections
<i>2. Is your agency currently conducting any research efforts addressing conservation issues involving lions? What about other agencies or departments within your national or regional governments and what are their roles? Are you aware of any NGO projects currently underway that involve lion conservation or management? If so, could you describe such projects or provide contact information to the organization carrying out the work?</i>	3, 4.1
V. HUNTING POLICIES/REGULATIONS	
<i>1. Please describe how lion hunting program functions within your country. Specifically, do you have an established national/regional hunting quota? How is this quota determined? Many countries have established age restrictions on harvesting lions. Has your country established such age restrictions and, if so, what are they and how are they implemented?</i>	5 and subsections 6 and subsections 7 and subsections
<i>2. What format do you use to manage sport hunting (i.e., establishment of national districts under government control, awarding hunting concessions to privately owned operations)?</i>	5 and subsections 6 and subsections
<i>3. If hunting areas/concessions allocated to safari outfitters, how are they allocated? What requirements have been established for the concession holders (i.e., mandatory census activities, assistance to local villages, etc.)? Are concessions awarded on an annual basis or for longer periods? If concession areas are centrally controlled by your government (e.g., several outfitters hunt in the same areas and no one outfitter is responsible for overall management), what mechanism is used to monitor and control outfitter activities?</i>	5 and subsections 6 and subsections
<i>4. How much do hunting licenses cost foreign hunters? How does your government utilize this revenue? Does a percentage go directly to lion conservation efforts or into more general wildlife management efforts? If so, what percentage is allocated to each? Is any of this revenue provided to local communities? If so, what percentage?</i>	11 and subsections 10 and subsections
<i>5. How does the sport-hunting program provide any other tangible benefits, besides revenue, to local communities (i.e., increase employment, jobs in anti-poaching units)?</i>	5 and subsections 10 and subsections