



# Professional Hunters' Association of South Africa

12<sup>th</sup> February 2018

## SCI POLICY ON CAPTIVE BRED LIONS

To the President, Board and Members of Safari Club International

On behalf of the Professional Hunters' Association of South Africa (PHASA) we want to thank you for your gracious hospitality, for hosting our Association and members at your annual convention in Las Vegas. It is indeed a privilege to be part of such an event and we would like to once again thank you for your loyal support that we, as an Association, have received from Safari Club International (SCI) over many years. We look forward to the continued cooperation between our two associations in finding meaningful solutions, which not only protects hunters' rights, but also promotes wildlife conservation.

As per our correspondence of the 29<sup>th</sup> November 2017, regarding the hunting of Ranched Lions, PHASA welcomes recommendations from fellow hunting association, which will be applicable to their membership should they wish to partake in such hunts.

It is of concern to the Professional Hunters' Association of South Africa (PHASA) and fellow hunters that the latest SCI policy on captive bred lions (2<sup>nd</sup> February 2018) does not protect the freedom of choice for hunters and will have a long-term negative impact on lion conservation in South Africa. Prior to the lion trophy import restrictions to the USA in 2016, lions were the most important single species to be hunted in South Africa. More than 95% of visiting hunters, chose to hunt lions of captive origin, with less than 5% hunting lions that were classified as wild or wild managed.

PHASA is currently in the process of developing the *Ranched Lions – Biodiversity Conservation Strategy* in co-operation with industry stakeholders to develop meaningful solutions for wild, wild managed and captive bred lions, in accordance with the Biodiversity Management Plan (BMP) for the African Lion (*Panthera leo*). This document will be forwarded to you in due course.

PHASA remains committed to finding meaningful and lasting solutions for the sustainable use of all natural resources, including lions, for the benefit of conservation and responsible hunting. The purpose of this document is to give a brief insight into the lion industry, in South Africa, so as to address your immediate concerns:

- the conservation value of captive bred lions, and
- the lack of consistency with SCI's criteria for estate hunting.

### The conservation value of captive bred lions

According to the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) an export permit shall only be granted for African Lion, an Appendix II species, when a Scientific Authority of the State of export, has advised that such export will not be detrimental to the survival of that species. On the 23<sup>rd</sup> of January 2018 the Minister of Environmental Affairs, Edna Molewa, published the Non-Detrimental Findings (NDF) for *Panthera leo* (African lion) as advised by the Scientific Authority of South Africa. (Ferreira. S, 2018) South Africa was the only African country with growth in every lion population, all of which were fenced. (Bauer. H, 2015)

Wild and re-introduced lions in South Africa are estimated to total about 3 490 individuals of which 2 376 (83% of the total wild population) are found within South Africa's national parks (Table 1). (Miller, 2016) There are currently about 500 lions on 45 small reserves that are smaller than 1 000 km<sup>2</sup> (Miller SM, 2013) (Miller, 2014). These lion numbers are stable and increasing (Miller, 2016)

**Table 1: Current numbers of wild lion in South Africa and surrounding transfrontier areas. All counts were made between 2008 and 2015 (Miller et al. 2016b).**

Location (sub-location)	Total lions (SA only)	Number mature lions (SA only)
Greater Limpopo TP (Kruger NP)	2000 (c. 1700)	1060 (c. 900)
Associated Private Nature Reserves (Greater Kruger NP)	300	160
Kgalagadi TP	520 (246)	255 (167)
Greater Mapungubwe TFCA	~50 (10)	25 (5)
Hluhluwe-Imfolozi Park	120	54
<b>Total excl. small reserves</b>	<b>2990 (2376)</b>	<b>1554 (1286)</b>
Small reserves	500	225
<b>Total incl. small reserves</b>	<b>3490 (2876)</b>	<b>1779 (1511)</b>

According to a study initiated in 2008 by the Department of Environmental Affairs (DEA) and conducted by the University of Free State, an estimated 3596 lions were kept in 174 breeding facilities in South Africa during 2008 (Taljaard 2009). It is estimated that at present between 3600 and 6000

According to recent data provided by the Department of Environmental Affairs (DEA) for the NDF there are an estimated 7 000 lions that are currently kept in approximately 260 breeding facilities in South Africa (Ferreira. S, 2018).

The captive bred lion population is more than double those of the wild and wild managed lions in South Africa.

The following statement is found on page 13 of the NDF.

***The trophy hunting of captive bred lions poses no threat to the wild lion population within South Africa, and is thought that captive lions may in fact serve as a buffer to potential threats to wild lions being the primary source of hunting trophies and derived products*** (Lindsey P, 2012)

Despite this NDF report by the Scientific Authority of South Africa, SCI's policy statement considers that the captive breeding of lions, for the purpose of hunting, has doubtful value to the conservation of lions in the wild (SCI, 2018). Hunting of lions is not allowed in any of the National Parks. According to the IUCN SSC Cat Specialist Group 2006, our National Parks are the only recognised areas with viable populations, that contribute to the conservation of lions in the wild. Wild lions are hunted in Associated Private Nature Reserves (APNR), bordering the Kruger National Park and are open to the park. (Ferreira. S, 2018)

The reintroduction of lions into about 45 smaller fenced game reserves (less than 1 000km<sup>2</sup>) in South Africa has largely been for commercial eco-tourism purposes, rather than ecological or conservation reasons (Slotow, 2009). Hunting may be permitted in these reserves, but they have doubtful conservation value, as they are not recognised by the IUCN as having viable or potentially viable lion populations. (Funston, 2015)

In light of the above-mentioned fact, that none of the smaller reserves (less than 1 000km<sup>2</sup>) in South Africa, have a conservation value for lions in the wild, has SCI not by default, closed down all lion hunting in South Africa other than lions lured out of National Parks?

Do we wish to solely promote this type of hunting in South Africa, considering the resounding public outcry over Cecil? In Zimbabwe prior to Cecil it was determined that 82% of sport-hunted lions were shot within 1 km of the Hwange National Parks boundary, and 72% of adult males and 60% sub adult males that were tagged in this study fell prey to hunters. (Loveridge, 2007)

The SCI policy will create an increase in demand for wild lions within South Africa. This could lead to an increase in hunting of the species on private and communal lands adjacent to protected areas, such as the Kruger National Park and the Kgalagadi Transfrontier Conservation Area, which could create sink effects similar to those seen around Hwange NP in Zimbabwe (Loveridge, 2007).

The greatest threats to lions generally (Bauer, 2016) include habitat loss and conversion of land use, indiscriminate killing to protect livestock, prey base depletion, direct consequences of the bush meat trade and excessive trophy hunting. The potential impact of captive bred lion hunting on the wider conservation of lions has been largely overlooked. (Hargreaves, 2010) (Lindsey P, 2012). PHASA identifies the following 5 key areas in which captive bred lions have a positive contribution to conservation.

- 1) Buffer to potential threats
- 2) Economic impact on rural economies
- 3) Conversion of land use
- 4) Genetic Diversity
- 5) Benefits to non-target threatened species

- **Buffer to potential threats**

- **Poaching of lions (Bone trade)**

- The trade in bones appears to be a sustainable by-product of the sizeable trophy hunting in SA and lions that are hunted are almost exclusively captive bred. Incidences of illegal activities such as poaching pertaining to wild lions are too sporadic to be of any detriment. Furthermore, the controversial trade in lion bones for the Asian market, appears to be supplied by bones obtained as a legal by-product of the trophy hunting industry where the lions are almost exclusively captive-bred (wild lions account for only 0.9 to 1.1% of lions hunted – (Lindsey P, 2012)). It would also appear that wild lions in South Africa are safe from the body parts trade for as long as captive-bred lions are the source of the derivatives. (Funston, 2015)

- **Poaching (Local medicine or witchcraft)**

- Captive lion facilities take the pressure off wild lions as these facilities are viewed as easier or softer targets by local poachers, who poison lions to supply the muthi market with body parts. (Loots, 2018)

- **Excessive harvest of wild lions**

Lion populations are particularly sensitive to trophy harvests due to the social disruption and potential for infanticide by incoming males following removal of pride males (Whitman, 2007)

Hunting of wild lion on private property in South Africa is limited, with less than 5% of lion hunts conducted over the 2008 to 2010 reporting period having targeted wild lions. (Ferreira. S, 2018) Other reports indicate that wild lions account for only 0.9 to 1.1% of the lions hunted annually by the trophy hunting industry in South Africa, (Lindsey P, 2012). It is therefore clear, that the hunting of captive bred lions alleviates any possible over harvest of wild lions in South Africa by the trophy hunting industry.

- **Economic impact on rural economies**

- **Conversion of land use**

The wildlife industry in South Africa is currently conducted on a large scale, with an estimated 9 000 wildlife properties covering an area of approximately 18 million hectares, which is 2.2 times greater than the state protected area network of the country (Van Hoven, 2005) (Els, 2017). What makes South Africa's wildlife industry unique in the world is that wildlife can be privately owned (Du Plessis, 1997). The majority of today's land, used for wildlife by the private sector in South Africa, has been converted from livestock and crop farms due to reasons such as wildlife developed an economic value, wherein the 1900's to 1960's wildlife was of very little value. It has since become more economically viable to keep and use wildlife, for commercial purposes, than livestock. (Cloete PC, 2015) (Peet Van der Merwe, 2017)

- **Top income generator**

In South Africa, lions are amongst the most sought-after animals for photographic safaris and trophy hunting, leading to the increase of lion breeding and populations on private land to the point where the private sector is responsible for managing the largest portion of the lion population in South Africa. The economic benefits of the lion breeding and hunting industry have been well documented by DEA over the years, where lions were the number one income earner, for the trophy hunting industry in South Africa. This has a positive multiplier effect on the entire hunting and wildlife industry in this country. The captive lion industry sustains about 1 162 jobs and contributes an annual value of more than R 316 million that benefits the poorest of the rural areas of our country. (Van de Merve et al. 2017).

The captive-bred lion hunting industry in South Africa has grown rapidly while the number of wild lions hunted in other African countries has declined. In 2009 = 833 and in 2010 = 682 captive lion trophies were exported from South Africa. This is more than double the combined exports from all other African countries. (2009 = 471 trophies and 2010 = 318 lion trophies) (Lindsey P, 2012)

Bans are a blunt instrument that risks undermining important benefits for both conservation and local livelihoods, thus exacerbating rather than addressing the prevailing major threats (Simon Stuart, 2016).

Figure 1 - South African annual trophy income from lion hunts. (DEA, 2018)



Note: The red bar for 2016 represents income loss after the ban was imposed on imports of lion trophies into the USA

Figure 1 – Shows the negative impact of the US Fish and Wildlife Services (USFWS) ban on the total income derived from lion hunting in 2016. For the first time since 2013, the lion was not the number one income generator for the South African hunting economy and was superseded by the Buffalo. (DEA, 2018)

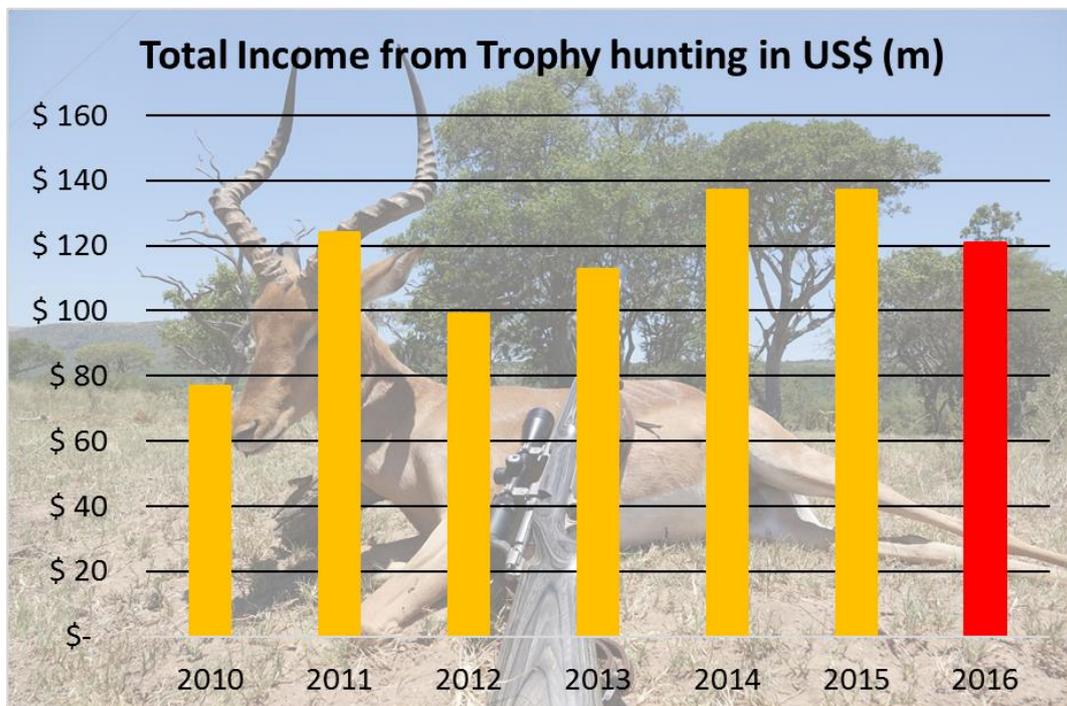
Figure 2 - Number of international trophy hunters visiting South African annually. (DEA, 2018)



**Note: The red bar shows the drop in visiting hunters to South Africa, after the ban was imposed on imports of lion trophies into the USA**

It would appear that the ban imposed on South Africa's number one trophy specimen, the African lion, also had an effect on the total number of international trophy hunters visiting the country, with a reduction of more than a 1 000 visitor from the previous year in 2015.

Figure 3 - South African annual income from trophy hunting of all species, (DEA, 2018)



**Note: The red bar represents income after the ban was imposed on imports of lion trophies into the USA**

The increase in total income (All species) shown in Table 2, for 2016 is due to Rand/Dollar fluctuations. Figure 3 which references in the annual income in USD Dollar terms shows a decreased income of US\$ 16 million or 11.6% from 2015 to 2016.

**Table 2 - South African annual income from trophy hunting of all species (including lions) in comparison to the total % income from lion hunting. (DEA, 2018)**

Year	Total Income (All Species)	Total Income from Lions	Lions % of Income of all species	Wild Lions % of Income of all species (R3 m per annum)
2013	R 1 072 m	R 121 m	11.29%	0.28%
2014	R 1 570 m	R 195 m	12.42%	0.19%
2015	R 1 740 m	R 181 m	10.40%	0.17%
2016	R 1 785 m	R 110 m	6.16%	0.17%

Table 2, shows the income derived from trophy hunting of all species as well as the income from lions in South Africa, from 2013 until 2016. It can be seen that the lion income dropped from a high of R 195m in 2014 to a low level of R 110m after the 2016 ban was imposed by the USFWS prohibiting imports of captive bred lion trophies into the US. The reduction of an estimated R 85m per year in income from 12.42% in 2014, to half this in 2016 at 6.16% has had detrimental consequences for conservation and the rural economy of South Africa. (DEA, 2018)

The total revenue from hunting wild and managed wild lions in South Africa, in the small reserves comprising of 8 000km<sup>2</sup>, are likely to only be about R3 million per year. (Funston, 2015) As shown in Table 2, this income derived from wild and wild managed lions, represents less than 0.3% of the annual revenue derived from the trophy hunting industry in South Africa.

Madikwe Game Reserve 620 km<sup>2</sup> requires a large management budget of US\$ 3 million (±R37.5 million) annually. The combined management budgets for 8 reserves smaller than 1 000km<sup>2</sup> require an annual management budget of US\$ 12.7 million (±R160 million) (Packer, 2013). According to the NDF report, these reserves lack the funding to manage their lion populations effectively (Ferreira. S, 2018).

*"On a national scale however, there is **NO budget or capacity to fund** a national coordinated system that can be implemented for all re-introduced lion populations. Thus, budget and legal restrictions are hampering the scaling up of local management to enhance a larger management framework for lion conservation. The biodiversity management plan for lion, that includes a meta-population management plan, has only recently (December 2015) been published for implementation. Confidence in the effective implementation of this management plan is thus still uncertain."* (Ferreira. S, 2018).

### *Differences between the hunting of Wild Lions and Lions of Captive Origin in South Africa.*

The NDF report highlights that the hunting of captive bred lions, differs from wild lion hunting in that hunts generally take place in smaller areas (49.9 to 8.4 km<sup>2</sup> compared to a minimum of 843 km<sup>2</sup>), hunts are cheaper (\$ 20 000 to \$ 40 000 compared to \$ 37 000 - \$ 76 000), hunting days are shorter (3,3 days compared to 14 - 21 days), success rates are higher (99% compared to 51- 96 %), and the trophy quality is higher (skull length + breath = 639 cm compared to 614-638cm). (Lindsey P, 2012)

Prior to the recent ban of imports of captive lion trophies to the USA, hunters could express their freedom of choice, and hunted over 600 captive bred lions as compared to less than 10 wild lions annually, in South Africa.

The above information shows that 95% of visiting lion hunters to South Africa, chose to hunt lions of captive origin, because they were shorter, more efficient, better quality, and more affordable lion hunts, as compared to the few wild lions, on offer. It is therefore difficult for those Hunting Outfitters (HO) offering the more expensive wild lions of poorer quality to compete with the hunting of ranched lions within, an open, free market system (South African Predator Association (SAPA) defines "Ranched Lions" as those lions that have been managed with a minimum amount of human imprinting and does not condone the hunting of captive bred lions that have been bottle raised or have had excessive human contact).

- **Rural Economic Development**

The economic contribution of lion breeding facilities are important as they are mainly situated in the rural provinces of South Africa (Free State, North West, Limpopo and Northern Cape) where there is a need for economic development and job creation since they are some of the poorest provinces (Peet Van der Merwe, 2017)

- **Genetic Diversity**

- Genetic diversity within a species is a most important consideration with regard to the long-term survival of that species. The greater the number of individuals within a species the greater the genetic diversity of that species. There are an estimated 3 490 wild lions and 7 000 captive lions in South Africa (Ferreira. S, 2018). Many of the 500 lions found in the smaller reserves are fragmented and genetically compromised as they have been allowed to inbreed and now lack genetic diversity.

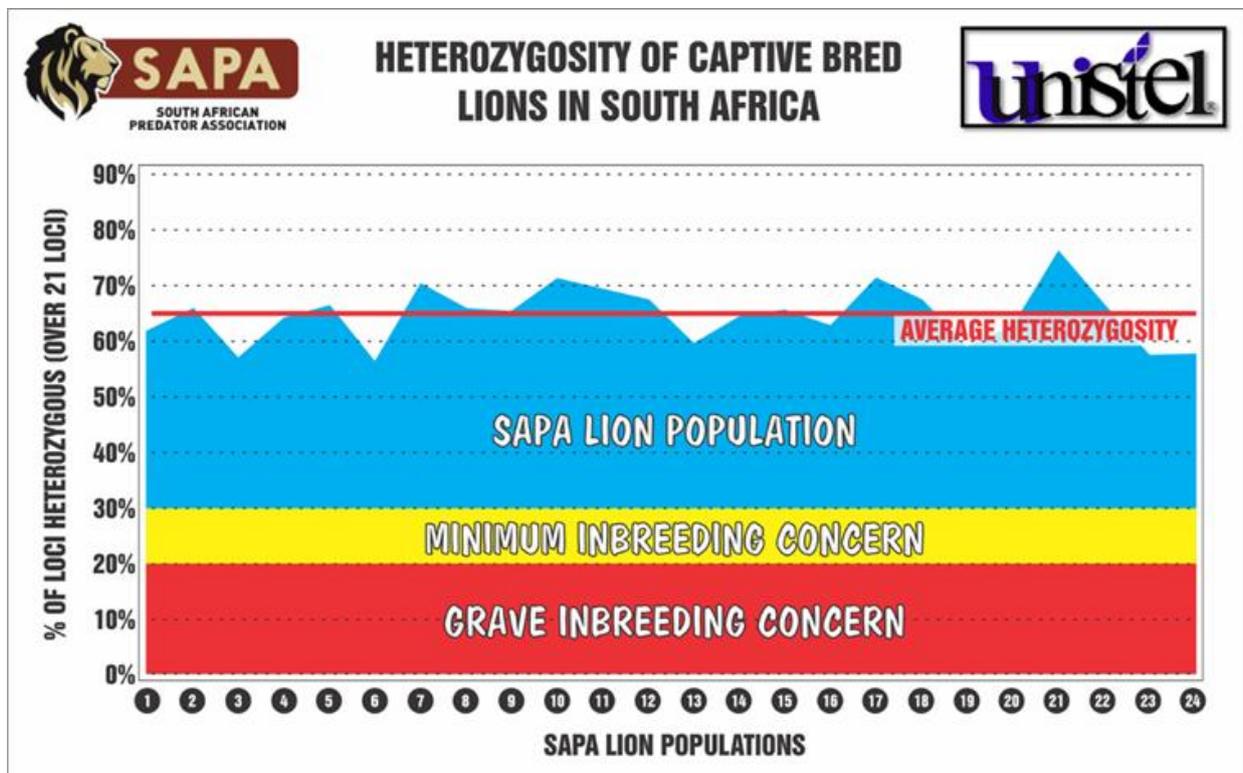
Lions were reintroduced into Madikwe Game Reserve in 1995. They formed the second largest population of reintroduced lions in South Africa after the Hluhluwe-Imfolozi Park. These lions originate from a founder population of four females and five males, and inbreeding started 5 years after this reintroduction. By the end of 2005, 105 cubs had been born. (Trinkel M, 2010)

The ultimate consequences of frequent close breeding include impoverishment of genetic diversity (Packer, 1991). The Madikwe lion population is genetically compromised yet has

been a source to re-establish lion populations in more than 15 reserves (Trinkel M, 2010) Given that Madikwe has one of the largest reintroduced populations, and that inbreeding could not be avoided, there are concerns about all small reintroduced populations in South Africa (Slotow, 2009). Many of these isolated lion populations display decreased genetic viability. (Grubbich, 2001)

- There are also numerous disease problems found in the larger wild lion populations. The potential genetic diversity or conservation value of the genetic resources, found in the large captive lion population cannot be ignored.
- A genetic study carried out on one captive lion population and 24 wild and wild managed populations showed that a number of unique alleles were found in the captive population. This suggests that there may be some genetic diversity in the captive populations that has been lost from the wild populations. This warrants further research into captive populations in South Africa to determine if unique diversity has been preserved in these captive populations and could be restored to the wild populations (Miller. Susan, August 23, 2014).
- In November 2016, a study was conducted that evaluated the Allele Frequencies, Heterozygosity and Inbreeding Coefficient of captive lions by Unistel Labs. The results as indicated in figure 4, showed significant genetic variation or heterozygosity of these captive lions, with no inbreeding concerns amongst any of the 24 individual populations that that were examined. (Marx, 2016)

**Figure 4 – Heterozygosity of captive bred lions in South Africa**



- Captive bred lions have the potential, to play an important role in the future relocation of, genetically diverse animals as part of a meta population management program.

- **Benefits to non-target threatened species**

**Table 3 - The contribution of South Africa’s private wildlife sector compared to parks in saving endangered species (Dry, 2016)**

SPECIES	TOTAL APPROX. (1950)	IN PARKS	ON PRIVATE RANCHES	TOTAL 2015
White Rhino	30	12 000	5 000 (30%)	17 000
Black Rhino	30	1 510	450 (23%)	1 960
Blesbok	2 000	25 000	>225 000 (90%)	>250 000
Bontebok	19	1 000	>7 000 (87.5%)	>8 000
Sable Antelope	450	<500	15 000 (97%)	>15 500
Roan Antelope	150	381	4 500 > (92%)	4 881
Cape Mountain Zebra	<80	1 925	865 (31%)	>2 790
Black Wildebeest	<500	1 800	>15 700 (87%)	>17 500

**Note: Lions could be added to this list, with over 7000 lions in private ownership, estimated to be double that of lions in parks and small reserves (3490).** (Ferreira. S, 2018)

- The hunting of lions, generated the greatest annual income in South Africa for many years, thus contributing financially to the conservation of endangered species within the private sector. The lion breeders are an important part of the same management model, that drives the game ranching industry in South Africa, providing land and conservation for many of our endangered species, by the private sector. This industry will continue to grow with additional land allocated for lion conservation and hunting provided it remains economically viable.

**SCI’s criteria for estate hunting**

The implementation of the SCI Estate Ruling for Lions needs to be clearly understood. It would appear that lions would need to be hunted out of breeding populations, running in natural habitats, with sufficient wild prey species and managed in similar manner to the small fenced reserves (under 1 000km<sup>2</sup>) that:

- 1) Are not recognised as having a conservation value due to no viable or potentially viable lion populations (Funston, 2015).
- 2) Are not economically sustainable, with high management costs, low levels of production, and unsustainably high levels of predation.
- 3) Have minimal hunting value as their lions contribute less than 0.3% to the current annual income generated from trophy hunting in South Africa. (DEA, 2018) (Funston, 2015)

- 4) Have small fragmented populations and will suffer serious genetic problems from inbreeding depression within a few generations unless immigrants from other populations are brought in (Frankham, 2009)
- 5) Any lions of captive bred origin retain this status regardless of the release period?

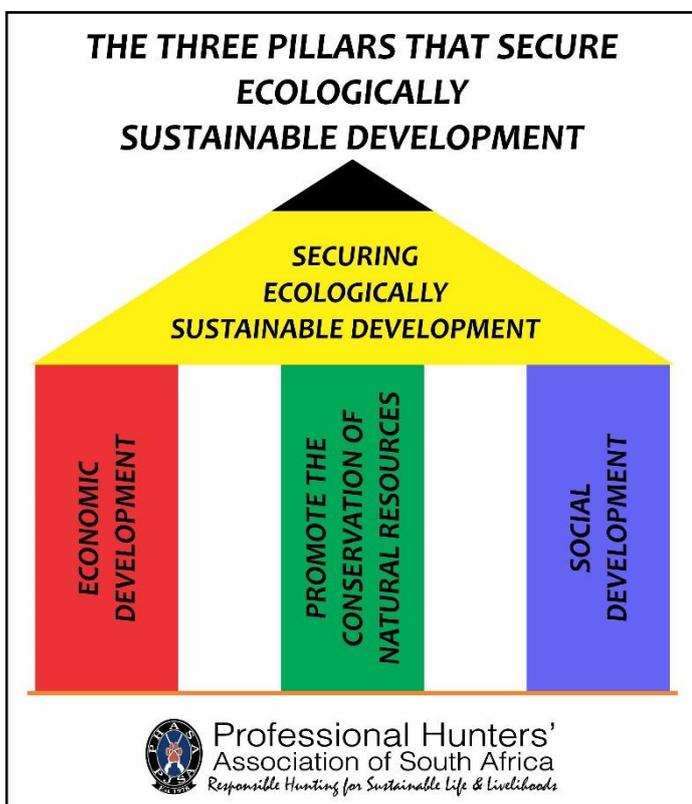
It is concerning that USFWS, Dallas Safari Club and SCI all wish to implement bans against a financially viable wildlife management system and support those that make limited contribution to the three pillars that secure ecologically sustainable development as they are a financial burden to the economy of South Africa.

PHASA is embracing its responsibility as tasked by the Minister of Environmental Affairs, Mrs Edna Molewa, who published in the Biodiversity Management Plan (BMP) for the Lion (*Panthera Leo*) in South Africa, under the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 Of 2004); That

PHASA must **“Assess the management of the captive lion population.”** In close collaboration with the South African Predator Association (SAPA) and top tier research institutions PHASA is confident it will be able to fulfil its task and facilitate the outcomes objectives of the BMP which are:

1. To improve the conservation status of lions within a broader conservation context, considering the respective role of wild, managed wild and captive populations, and;
2. Encourage the development of opportunities for economic and social benefits from responsibly managed - wild, managed wild and captive lion populations.

The Biodiversity Management Plan (BMP) for the Lion (*Panthera Leo*) in South Africa, has a clear and concise vision for the entire lion population in South Africa. (Funston, 2015)



**Vision of the BMP for lions:**

***Through the existence of stable, viable and ecologically functional populations of wild and managed wild lions, along with well-managed captive populations that have minimal negative conservation impacts, lions will provide key opportunities for biodiversity conservation, economic development, social benefits and improved management capacity.*** (Funston, 2015)

The captive bred lion industry plays a most important holistic role in all three pillars that secure ecologically sustainable development.

## DISCUSSION

### *Anti-captive lion hunting movement*

Are decisions made concerning the captive lion industry, based on scientific facts and sound socio-economic principles, which are in accordance with the constitution of our country? Or are they made as a result of emotionalism and the sensational propaganda perpetuated by the anti-sustainable use brigade, fuelled by unethical actions of media reporters and certain hunters who may be protecting their own commercial interests?

The anti-hunting activists have cunningly used legitimate difference of opinions concerning “ethics” and vested commercial interests to create divisions within the hunting industry. The modern media fuels any controversy by publishing sensational propaganda, rather than the truth, in order to sell their storyline. As stated by the Minister of Environmental Affairs “*Peddling half-truths and unsubstantiated claims of widespread canned hunting is damaging our reputation for species conservation.*” (Molewa, 2015)

## CONCLUSION

According to the IUCN – Regional Red Data List Status (2016) lions in South Africa are considered to be of Least Concern with over 2 876 mature wild individuals in South Africa. However, the Global Red Data List Status for lions in the rest of Africa remains vulnerable as population have decreased by 62%. (Bauer, 2016)

South Africa has a different wildlife management model to the rest of Africa. It is the most densely populated and developed country in the sub-continent with only a few pockets of wildlife conservation areas in existence a few decades ago. The current conservation success story in South Africa has taken place on land, that was once lost to conservation, and is based on private ownership of wildlife with a positive economic value to landholders. Despite having the greatest human pressure on land, we are able to conserve our iconic species such as lion, through sustainable utilization of wildlife. This provides a greater economic benefits than other land use options and will continue to grow the conservation and hunting footprint of our country.

Remove the economic viability of wildlife, including ranched lions, to landholders through overregulation, poor administration or trade bans and all lion populations will diminish in South Africa with increased poaching, as is the case in the rest of Africa.

The most important single aspect that has changed in the South African context since the previous USFWS finding is that the Scientific Authority of South Africa has released a positive Non-detrimental finding (NDF) assessment for *Panthera leo* (African lion) in our country. The role played by the large number of captive bred lions in South Africa, towards this NDF has been acknowledged, despite serious opposition from those who wish to override the constitution of our country and prohibit the sustainable use of natural resources for the benefit of our people.

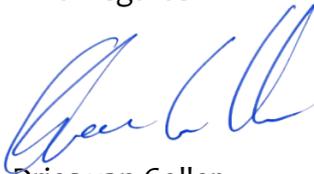
PHASA urges USFWS, DSC, SCI and all genuine conservation organizations, to work with us towards taking responsibility for the long-term conservation of all lions in South Africa and lift the ban on the importation of trophies of ranched lions from our country as soon as possible.

As an association of dedicated professional hunters' that specialise in the highest personal customer service, PHASA would welcome any complaints, from SCI members who are dissatisfied or had a dissatisfactory experience in South Africa, whilst on a captive lion hunt. The information from such a complaint would be invaluable in addressing concerns. As discussed previously PHASA is currently in the process of developing the *Ranched Lions – Biodiversity Conservation Strategy* for the benefit of all lions throughout South Africa and stakeholder input is key to the success of this document.

PHASA asks SCI to take into consideration that conservation on private land in South Africa is a by-product of the socio-economic benefits derived from optimal wildlife management practices. The implementing of trade bans on these economic activities, will have devastating long-term negative effects for wildlife conservation in South Africa. We support SCI as being "*FIRST FOR HUNTERS*" and are committed to build and conserve our Worlds Wildlife Heritage.

PHASA kindly requests the SCI board to review its current position statement on captive bred lions. Should SCI or your members require any further information you are welcome to contact us.

Kind Regards



Dries van Coller  
PHASA President

Dries van Coller, PHASA president, [president@phasa.co.za](mailto:president@phasa.co.za) or Marianna Louwrens at [info@phasa.co.za](mailto:info@phasa.co.za) and Tersia Du Plooy at [phasa@phasa.co.za](mailto:phasa@phasa.co.za)

## References

- Bauer H., Packer, C., Funston, P.F., Henschel, P. & Nowell, K.** The IUCN Red List of Threatened Species 2016: [Online] // [iucnredlist.org](http://iucnredlist.org). - 2016. - 11 02 2018. - <http://DX.DOI.ORG/10.2305/IUCN.UK.2016-3.RLTS.T15951A107265605.en>. - e.T15951A115130419..
- Bauer. H Chapron. G, Nowell. K, Henschel. P, Funston. P, Hunter. L.T.B, Macdonald. DW, and Packer. C** Lion (*Panthera leo*) populations are declining rapidly across Africa, except in intensively managed areas [Journal] // PNAS. - 2015. - 48 : Vol. 122. - pp. 14894-14899.
- Cloete PC Van der Merwe P, Saayman M** Profitability of the game ranching industry in South Africa. [Book]. - Pretoria : Caxton Publishers, 2015. - 2nd .
- DEA Hunting Stats** Hunting Statistics. - Pretoria : Department of Environmental Affairs, Republic of South Africa, 2018.
- Dry Dr G C** Conservation Judisprudence [Journal] // Wildlife Ranching Magazine. - 2016. - 1. - pp. 25-29.
- Dry Dr Gert** GAME RANCHING IS A BIODIVERSITY ECONOMY ASSET CLASS AND NOT A GOVERNMENT CONSERVATION ESTATE [Conference] // 49th SASAS Congress, Western Cape. - [s.l.] : Unpublished, 4 July 2016.
- Du Plessis** Benuttingsvorme in die wildbedryf: "n bestuursrekeningkundige evaluering. [Report]. - North-West University : PhD, 1997.
- Els** Determining the economic significance of the lion industry in the private wildlife tourism sector. [Report]. - North West University : Master"s Dissertation, 2017.
- Ferreira. S Funston. P, Pfab. M, Carrol. T, Selier. J** Non-detriment finding assessment for *Panthera leo* (African lion) [Report]. - South Africa : Government Gazette, 2018.
- Frankham R.** Genetic considerations in reintroduction programs for large terrestrial predators. [Book Section] // In The reintroduction of top-order predators / ed. Hayward M.W. & Somers, M.J. (Eds). - Oxford : Blackwell Publishing, 2009.
- Funston P** Biodiversity Managment Plan for the Lion (*Panthera leo*) in South Africa [Journal] // Government Gazette. - 2015. - pp. 1-66.
- Grubbich J.D.** Genetic variation within and among fragmented populations of South African lions *Panthera leo*: implications for management [Report]. - Pretoria : MSc thesis, University of Pretoria, 2001.
- Hargreaves R.** An analysis of the argument that breeding and keeping lions in captivity in South Africa for use in so called 'canned hunts' is ethically sound because the practice reduces the hunting pressure on wild lions throughout the whole of Africa [Journal] // Unpublished Report, WildCat Conservation Legal Aid Society, Washington, DC. - 2010.
- Hutton J** CITES: Authority Without Accountability a Responsibility. [Online]. - 2010. - Html file: 15-02-2010..
- Lindsey P Alexander R, Balme G, Midlane N, Craig J** Possible Relationships between the South African Captive-Bred Lion Hunting Industry and the Hunting and Conservation of Lions Elsewhere in Africa [Journal] // South African Journal of Wildlife Research. - 2012. - Vol. 42. - pp. 11-22.
- Loots Pat** Game Rancher [Interview]. - 11 02 2018.

**Loveridge A., Searle, F. Murindagomo & Macdonald, D.** The impact of sport-hunting on the population dynamics of an African lion population in a protected area. [Journal] // *Biological Conservation*. - 2007. - Vol. 134. - pp. 548-558.

**Marx Munro** Dr. - Stellenbosch : [s.n.], November 2016.

**Miller S.M. & Funston, P.J.** Population growth rates of lions (*Panthera leo*) on small, fenced reserves in South Africa: a management dilemma [Journal] // *South African Journal of Wildlife Research* . - 2014. - Vol. 44. - pp. 43-55.

**Miller S.M., Riggio, J., Funston, P., Power, J., Williams, V., and Child, M.** A Conservation Assessment of *Panthera leo* [Journal]. - South Africa : South African National Biodiversity Institute and Endangered Wildlife Trust, 2016.

**Miller SM et al** Management of reintroduced lions in small, fenced reserves in South Africa: an assessment and guidelines. [Journal] // *South African Journal of Wildlife Research*. - 2013. - Vol. 43. - pp. 138-154.

**Miller. Susan Harper. Cindy, Bloomer. Paulette, Hofmeyr. Jennifer, and Funston. Paul** Evaluation of Microsatellite Markers for Populations Studies and Forensic Identification of African Lions (*Panthera leo*) [Journal] // *The Journal of Heredity*. - August 23, 2014. - Vol. 105. - pp. 856-866.

**Molewa Ms Edna** Let's put the lid on wild tales of canned hunting [Report]. - [s.l.] : Sunday Times News Paper, 2015.

**Packer C., Canney, S., Loveridge, A., Garnett, S.T., Zander, K.K., Balme, G., Bauer, H., Begg, C., Begg, K.,** Conserving large carnivores: dollars and fence [Journal]. - [s.l.] : *Ecology Letters*, 2013. - 5: 635-641 : Vol. 16. - DOI: 10.1111/ele.12091.

**Packer C., Pusey, A.E., Rowley, H., Gilbert, D.A., Martenson, J. & O'Brian, S.J** Case study of a population bottleneck: lions of the Ngorongoro crater. [Journal] // *Biological Conservation*. - 1991. - Vol. 5. - pp. 219-230.

**Peet Van der Merwe Melville Saayman, Jauntelle Els and Andrea Saayman** The economic significance of lion breeding operations in the South African Wildlife Industry [Journal] // *International Journal of Biodiversity and Conservation*. - 2017. - 11 : Vol. 9. - pp. 314-322.

**SCI Safari Club International** [Online]. - 02 02 2018. - 12 02 2018. - [www.safariclub.org](http://www.safariclub.org).

**Simon Stuart Luc Bas** IUCN [Online] // Informing decisions on trophy hunting, A Briefing Paper for European Union Decision-makers regarding. - April 2016. - [http://cmsdata.iucn.org/downloads/iucn\\_informingdecisionsontrophyhuntingv1.pdf](http://cmsdata.iucn.org/downloads/iucn_informingdecisionsontrophyhuntingv1.pdf).

**Slotow R. & Hunter, L.T.B** Reintroduction decisions taken at the incorrect social scale devalue their conservation contribution: African lion in South Africa [Book Section] // *The reintroduction of top-order predators* / ed. Hayward M.W. & Somers, M.J. (Eds). - Oxford : Blackwell Publishing, 2009.

**Taljaard P** Report on the captive lion breeding industry in South Africa. [Report]. - Bloemfontein : Unpublished report, University of the Free State, 2009.

**Trinkel M Funston P, Hofmeyr M, Hofmeyr D, Dell S, Packer C, Slotow R** Inbreeding and density-dependent population growth in a small, isolated lion population [Journal] // *Animal Conservation*. - 2010. - Vol. 13. - pp. 374-382.

**Van Hoven** Ecotourism and game ranching: why it works [Conference]. - Johannesburg : (Paper delivered at the Ecotourism South Africa Confex at the Indaba Hotel Johannesburg South Africa on the 9-11 November 2005) (Unpublished), 2005.

**Whitman K., Starfield, A., Qualding, H. & Packer, C** Modelling the effects of trophy selection and environmental disturbance on a simulated population of African lions [Journal] // Conservation Biology. - 2007. - Vol. 21. - pp. 591-601.