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Trophy hunting in South Africa: is it worth it?

An evaluation of South Africa's policy decision to elevate trophy hunting as a key conservation tool

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Executive Summary

The key question for this paper is whether the South African government is warranted in its recent decision to elevate trophy hunting as a key element of its conservation strategy. It is a paper in two parts. The first is a literature review that begins by examining the global debate over the efficacy of trophy hunting as a conservation tool. It then examines the recently released high-level panel report (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020), which itself gave birth to a draft policy position (Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros, 2021). The literature review essentially concludes that South Africa's emphasis on trophy hunting as a conservation tool is based on flimsy empirical grounds, and is at odds with the scholarly work that raises questions not only about trophy hunting's efficacy but also its likely harm. The government's apparent commitment to trophy hunting neither considers the opportunity costs associated with the practice, nor its negative externalities. That trophy hunting might generate some economic benefit is insufficient grounds on which to promote it as a conservation-enhancing mechanism, especially if that miniscule economic benefit comes at the cost of alternative, more sustainable forms of conservation-advancing revenue.

The second part of the report then answers a specific set of questions pertaining to trophy hunting in South Africa. The three most important questions are essentially as follows:

* Ross Harvey, Director of Research and Programmes at GGA, was the lead author on the report. He was ably supported by the Governance Insights and Analytics team: Chrissy Dube, Monique Bennett and Pranish Desai

What is the evidence, from an economic perspective, that trophy hunting is critical to conservation in South Africa?

The answer is that there is extremely little evidence. This is detailed in the report, and the available evidence is thoroughly examined. Very little peer-reviewed economic work addresses the question, and the one (and only) paper (Saayman et al., 2018) that does so is questionable in its methodological rigour. It estimates the value of trophy hunting to South Africa, including multiplier effects, at $341 million for the 2015/16 season. By contrast, tourism in 2019 was worth $22.1 billion. At best, trophy hunting supports an estimated 15,000 jobs in South Africa, whereas non-consumptive tourism supports at least 90,000 estimated jobs. Increasingly, trophy hunting presence appears likely to directly undermine non-consumptive tourism potential, which strengthens the argument for the abandonment of the practice. In short, it is extremely challenging to sustain an economic argument in favour of trophy hunting in South Africa as a key conservation tool.

What is the evidence that trophy hunting in South Africa is economically important?

Compared to non-consumptive tourism, trophy hunting provides very little economic benefit to the country. The arguments typically offered in support of trophy hunting in South Africa is that even if the practice does not generate a large amount of revenue, this revenue is especially significant for the poor in rural areas where other economic opportunities are largely absent. Again, however, the research shows that a tiny volume of overall trophy hunting revenue accrues to low-income households. It appears, by and large, to be an economically extractive and ecologically harmful hobby for the rich that benefits the rich. This much is made clear in the report.

If the conservation benefits of trophy hunting are questionable, and the economic contribution miniscule, why is the South African government promoting the practice?

The High-Level Panel report is relatively clear-eyed in its assessment of most conservation challenges in South Africa. A serious anomaly in this regard is its unsubstantiated support for trophy hunting, which it declares to be a key conservation tool without marshalling any empirical evidence to that end that can withstand scrutiny. The scrutiny provided in this report strongly suggests that the government has little economic, ecological, social or ethical grounds on which to support trophy hunting of elephant, rhino, giraffe, lion or leopard, and the Draft Policy Position is therefore deficient in doing so. Moreover, and perhaps most importantly, the caveat from the most ardent academic supporters of trophy hunting as a necessary conservation tool emphasises the importance of good governance as a necessary condition for its success. There is next to no evidence that trophy hunting has been, or will be, well governed in South Africa. Even if it was, the fact that the practice may directly undermine other economic activities such as non-consumptive tourism, is a good *governance* reason to abandon the practice and condemn it.

A critical review of the trophy hunting literature in South Africa

Introduction

Trophy hunting, especially of iconic or endangered species, is a controversial subject (Chapron & López-Bao, 2019; Dickman et al., 2019; Nowak et al., 2019). Scientists are increasingly drawing attention to the *Anthropocene* – chaotic climate events directly attributable to human beings having overstepped a number of interconnected planetary boundaries (Leach et al., 2013; Lenton et al., 2019; Raworth, 2017; Ripple, Newsome, et al., 2016). In this context, the world is rightly asking whether the legally sanctioned killing of wild animals can reasonably be tolerated. According to the latest IPBES Global Assessment, human activities are currently driving an unprecedented loss of biodiversity. At least one million animal and plant species are reportedly threatened with extinction (United Nations, 2019). Direct exploitation is the second most important driver of biodiversity loss. Given that trophy hunting is an obvious form of direct exploitation that undermines ecosystem functionality, and is hardly a requirement for human survival, its continuation should be plainly understood as a likely hindrance to conservation.

Alongside the loss of biodiversity is the increasingly tangible spectre of catastrophic climate change. Biodiversity loss and climate change are mutually reinforcing tragedies. A number of leading scientists issued a brief paper shortly before the release of the latest UN IPCCC report indicating that transformative change is urgently required if humanity is "to protect life on Earth and remain within as many planetary boundaries as possible" (Ripple et al., 2021). They reiterate calls made in 2020 for specific policy measures but add another three. The third of these provides the broad conceptual framework under which this review falls. It reads as follows: "The development of strategic climate reserves to strictly protect and restore natural carbon sinks and biodiversity throughout the world" (Ripple et al., 2021). These would provide protection and restoration, which offers "enormous co-benefits for biodiversity, ecosystem function and human wellbeing..." (Ripple et al., 2021).

This literature review begins by providing a summary outline of the debate pertaining to trophy hunting and whether it provides conservation value or not. Secondly, it examines the literature pertaining specifically to South Africa. Of particular interest are the findings of the recently established High-Level Panel (HLP) to examine questions of conservation management for elephant, rhino, lion and leopard (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). This panel was established in October 2019 by South Africa's Minister of Environment, Forestry and Fisheries, Barbara Creecy, in part as a response to the furore over captive lion breeding, canned hunting and the associated lion bone trade (Born Free Foundation, 2018; EMS Foundation & Ban Animal Trading, 2018; R. G. Harvey, 2020; Hunter et al., 2013). A draft policy paper has been gazetted in the wake of the panel's findings (Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros, 2021). Third, the review presents the case for more robust cost-benefit analyses of whether trophy hunting of imperilled species in South Africa possesses conservation value or not. This constitutes the crux of the review; a disproportionate volume of effort is expended in examining the claims of a study by Melville Saayman and his co-authors on the economic impact of trophy hunting in South Africa, as this is the only study of its kind in the peer reviewed literature (Saayman et al., 2018). That this is the only study available is a thorough indictment on the state for supporting trophy hunting as a conservation tool, as it hardly constitutes supportive evidence for such patent direct exploitation in exchange for relatively small economic benefit.

This review concludes by suggesting that in a world increasingly at risk of catastrophic climate events, the economic value of maintaining intact carbon landscapes cannot be overstated. Where the trophy hunting of vulnerable species – specifically elephant, rhino, lion and leopard – contributes to the fragmentation of landscapes that could otherwise be joined together, it should be reconsidered. In South Africa, the vast majority of trophy hunting occurs on

small private reserves that are largely unamenable to being joined together for the sake of developing wild landscapes at the scale required to allow natural processes to occur. These private reserves should strongly consider developing such landscapes, as their conservation reputation will become increasingly *economically* valuable with the growth of the ethical tourism movement, which views trophy hunting as incompatible with ecotourism.

Trophy Hunting – of conservation value or not?

Scholars that promote trophy hunting of imperilled species typically offer the consequentialist view that landscapes which provide habitat for these species would be lost to other more ecologically destructive practices were it not for the revenue generated by trophy hunting. They are sceptical of the claims that alternative land-use options that preserve biodiversity are available or feasible at the necessary scales. Many of these scholars find the practice, at a personal level, opprobrious but are prepared to sacrifice this discomfort on the altar of what they deem to be a necessary evil. Nonetheless, the argument is generally that hunters are willing to travel to areas that are aesthetically unamenable to photographic tourism. Here, thus, hunters not only purportedly maintain intact landscapes but also provide on-the-ground presence which would otherwise be absent, and crowds out would-be poachers from becoming encamped in abandoned areas. Hunters themselves, the argument goes, also have a lower ecological footprint per dollar spent than photographic tourists, and at least a portion of the hunting revenue accrues to local communities on the frontlines of conversation in remote areas. This revenue ostensibly provides an incentive to preserve wildlife, or at least increases the tolerance threshold for human and wildlife conflict. There is of course a question, both about the extent to which trophy hunters truly do have a lower ecological footprint and what proportion of revenue actually accrues to local community beneficiaries.

Scholars of the view that trophy hunting harms conservation typically respond along four distinct but overlapping lines.

First, they critique the consequentialist motif on ethical and methodological grounds. The consequences of abandoning hunting may not result in landscape destruction (Chapron & López-Bao, 2019). The claim that abandoning trophy hunting will destroy wild landscapes is essentially unfalsifiable – an assertion that cannot be tested while hunting still exists and is politically protected across large landscapes. Moreover, there is a recent counterfactual in the natural experiment that arose from Botswana abandoning trophy hunting for the five years from late 2013 to the end of 2018. Botswana now hosts the world's single largest African elephant population, with elephants from neighbouring countries likely having migrated semi-permanently to Botswana to evade hunting and poaching elsewhere. It would be premature to assert that such a growth in population is singularly attributable to Botswana's policy decision to stop trophy hunting, though the correlation suggests that further study to ascertain causality is warranted. Scholars opposed to consequentialist reasoning also point out that killing to conserve is a moral contradiction not easily resolved (Batavia, Bruskotter, et al., 2019; Batavia, Nelson, et al., 2019).

Second, they critique the arguments on biological grounds. Elephant tusk sizes, for instance, are becoming increasingly smaller as a result of prime males being targeted (through poaching) (Chiyo et al., 2015). Trophy hunting targets the same animals, risking an additive effect (Schlossberg et al., 2019). This suggests that hunters are not selecting animals that are surplus to biological requirements as is often claimed in defence of hunting. Rather, they are eliminating animals that would otherwise be contributing to the health of the gene pool. This exemplifies the ironic way in which trophy hunting ultimately undermines itself. A number of studies have demonstrated that elephant male bulls are increasingly reproductively successful over time, with older males, according to one study, producing at least as many offspring, on average, over the age of 50 as those between ages 30 and 35 (Coltman et al., 2003; Lee et al., 2011; Rasmussen et al., 2008; L. A. Taylor et al., 2019). The idea that older male bulls are surplus to genetic requirements demonstrates a profound misunderstanding of genetics – large-tusk genes, for instance, are not necessarily transferred between when a bull elephant enters must, and the age of 35 (the lower threshold above which most legal hunting is permitted). Moreover, hunters are selecting the very animals that are most important to other animals; the ecological integrity of the landscape in which they live; and to photographic tourists. A number of recent incidents reveal, for instance, that hunters are not shooting male lions that are beyond their prime mating age. Although Tanzania introduced a 6-year minimum age limit for shooting lions, one important study notes that 66.7% of the lions shot in that country were 5 years old or under, "underlining the fact that there were simply no lions of the correct age left to be shot" (Chardonnet, 2019, p. 34). Trophy hunters demand the best-looking animals, as trophy hunting is driven by the aesthetic desire for an animal in its prime. The argument that they are only shooting surplus animals, primarily to support conservation efforts, appears dubitable.

Third, scholars that question the conservation value of trophy hunting are concerned that the economic arguments lack reliability and robustness. A 2013 study questioned the claim by Safari Club International (SCI) that hunting generates revenues of $200 million annually in remote rural areas of Africa – which was built predominantly on figures from an unpublished study by the Professional Hunters Association of South Africa (PHASA), a lobby group with a vested industrial interest in swaying the argument in favour of hunting.[1] The 2013 study also points out that a small percentage of total revenues actually accrue to the local communities who are purportedly the major beneficiaries of hunting revenue (Economists at Large, 2013). A follow-up study from the same group of economists questioned a claim by Southwick Associates in 2015 that hunting generated $426 million to the eight countries of Botswana, Ethiopia, Mozambique, Namibia, South Africa, Tanzania, Zambia and Zimbabwe. Economists at Large found, to the contrary, that "a more realistic estimate is less than $132 million per year", tantamount to only 0.78% of the overall estimated tourism contribution to GDP in those eight countries. Similarly, the claims that trophy hunting supports more than 53,000 jobs is more likely to be closer to between 7,500 and 15,500 jobs, roughly 0.76% of average direct tourism employment (Murray, 2017). A landmark 2019 study by Bertrand Chardonnet shows that, simply due to the decline of the industry, "the hunting market does not have the means to pay the real price of safaris. A very good hunting zone has a lion

1 The retort is that studies such as the one referenced below by Economists at Large are commissioned by groups that have a similarly vested interest in swaying the argument in the opposite direction.

density of 2 per 100km^2, and thus it needs a hunting surface area of 5,000km^2 to shoot one lion per year sustainably. The annual upkeep alone of this area costs around 4 million USD (and probably more for a lion population of this type, due to the management of conflicts with the [human] population). The sales price of a safari to hunt lions is on average 50,000 USD, in other words 1.25% of the cost price". The conclusion is clear that hunting is powerless to fund basic conservation requirements. Importantly for this review, Chardonnet also notes that even in South Africa, where private "game farms" are self-funded through hunting revenues and are deemed to account for South Africa's "conservation success story", the number of foreign hunters had decreased by 50% in just a few years prior to 2018 (according to Peter Flack, a strong proponent of trophy hunting and the South African model of private land ownership).

Fourth, scholars committed to the view that trophy hunting is a kind of necessary evil in a second-best world invariably hedge their positions, with the proviso that the arguments only hold if trophy hunting is well governed (Brink et al., 2016; Challender & Cooney, 2016; Nelson et al., 2013; Orr, 2016)(Brink et al., 2016; Challender & Cooney, 2016; Nelson et al., 2013; Orr, 2016). It is difficult to find empirical examples of where hunting is well governed in practice. In open systems such as the Selous Reserve in Tanzania (most of which is now the Julius Nyerere National Park), achieving good governance has proved challenging. One of the major arguments that has been offered in favour of trophy hunting is that it crowds out poaching presence (as mentioned earlier) but the Selous example empirically defies that contention. Chardonnet, among others, points out that from 2006 to 2014, the Selous lost roughly 70,000 elephants in a poaching onslaught that hunters (which effectively owned 19 of the reserve's 20 concessions) appeared powerless to prevent. Even scholars that favour trophy hunting as a conservation tool recognise that the hunting concession owners may have been less than scrupulous in their dealings with local political elites who were benefiting from ivory sales (where raw ivory prices peaked in 2014 at around $2,100/kg in Asian markets) (Alden & Harvey, 2021; Baldus, 2009). The industry is rife with corruption (Leader-Williams et al., 2009), which is one of the reasons offered by former Botswana president Ian Khama for banning trophy hunting in that country in late 2013.

Hunting quotas are usually established on the grounds of a scientifically determined 'maximum sustainable yield (MSY)' – the maximum number of animals that can be killed without jeopardising the population growth trajectory and ensuring the future sustainability of the industry. There are two problems with the governance processes involved, quite aside from the incentive-incompatibility problem. First, it is very difficult to establish a scientifically reliable MSY for any given species. The Botswana government recently decided to allow an annual elephant trophy hunting quota of 200 for 2021 on the basis that it was sustainable against the population estimate of 130,000. The quota was divided up with different allocations per area. At no point in the process of establishing the quota did the government reveal the scientific method by which the quota was derived. It overlooked the fact that elephant populations are not static; therefore, asserting that one can shoot five in one area and 20 in another appears random at best. It also overlooked the fact that bull elephants are especially important to sustaining the integrity of elephant populations and there is no such thing as a "surplus" bull (Allen et al., 2020). No science was put forward in the public domain that defended the dictum that 200 could be removed at no future conservation cost to the country's elephants (especially given the dwindling numbers of large-tusked bulls). In South Africa, the government issued leopard trophy hunting quotas until it suddenly stopped doing so in 2016 through to 2019 (barring 2018) upon confession that it had no scientific basis on which to establish the quota. Despite the absence of a quota in 2016, 2017, and 2019, South Africa still has a disproportionate CITES export quota of 150 leopard per year for all years.

From a game-theoretic perspective, hunters in open, unfenced landscapes have little incentive to observe quotas, even if such quotas are scientifically established. Most of the world's animal 'stocks' – from marine to terrestrial species – are over-harvested. The incentive to over-harvest private trophies is not matched by credible deterrents to avoid such harvesting in weakly institutionalised contexts. The payoff profile for an individual hunter or concession owner would thus typically incentivise over-harvesting, undermining the MSY. In closed landscapes, however, the incentive structure is different. Private landowners have a strong incentive to ensure that sufficient stock volumes remain in any given year to sustain the business the following year. However, the incentive to breed intensively for stocking hunting farms is evidently strong and can lead to serious conservation defects (J. Selier et al., 2018). Moreover, landscape fragmentation typically results, as landowners avoid incurring the risks associated with joining up farms to create integrated landscapes. A less scrupulous neighbour with a higher

discount rate might over-harvest this year's available elephant 'stock', for instance, jeopardising the future of the business. This is the logic that appeared to play a significant role in the demise of the Selous elephants mentioned above.

These considerations are particularly important for South Africa, given the dominance of the private landowner model (aside from exceptions such as the Associated Private Nature Reserves (APNR), which entails its own set of governance challenges). Before assessing these, however, the review now turns to examining the findings of the HLP and the resultant Draft Policy paper for the management of rhinos, elephants, lions and leopards. The review locates these findings within the general global climate challenge and the particular global debates concerning trophy hunting.

High-level panel with reference to hunting in South Africa

The appointment of the Advisory Committee (otherwise known as the high-level panel or HLP) was gazetted on 10 October 2019. As the committee itself notes in the report, it was constituted in the wake of "public concern as to policies, legislation and practices on matters associated with the breeding, hunting, trade and handling of elephant, lion, leopard and rhinoceros, especially in terms of animal welfare and well-being" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). Commendably, the HLP established a working vision against which to reference their collective thinking: "Secured, restored, and rewilded natural landscapes with thriving populations of Elephant, Lion, Rhino and Leopard, as indicators for a vibrant, responsible, inclusive, transformed, and sustainable wildlife sector." (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). There are 18 recommendations, only two of which will be mentioned for the purpose of this review.

Recommendation 18 reads that "three different approaches to captive lions are presented by the panel, with the majority view being that, in future, South Africa will not captive breed lions, keep lions in captivity, or use captive lions or their derivatives commercially". This majority view explicitly rejects the trophy hunting of captive-bred lions, a rational assessment in the wake of strong evidence suggesting that commercial lion breeding is likely value-destructive in both conservation and tourism terms (R. G. Harvey, 2020). At present, very little trophy hunting of wild lions occurs in South Africa.

One of the more controversial recommendations is number 11: "The HLP identifies the need for South Africa to be repositioned and promoted as a destination of choice for **legal, regulated and responsible hunting of the five iconic species, recognising that this supports and promotes conservation and rural livelihoods**." (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). In its summary remarks, however, the report identifies the serious challenge of "irresponsible and unsustainable hunting practices, unethical tourism practices and reputational damage to the sector and South Africa". Establishing hunting quotas was similarly identified as a governance challenge. The recognition of these challenges and the emphasis on *legal, regulated and responsible hunting* clearly connects with the broader point made earlier that the promotion of trophy hunting is invariably couched in language that presupposes that it can only be sustainable if sound governance mechanisms are instituted and practiced. Much of the executive summary of the HLP report, however, identifies myriad governance challenges, including confusion of roles and contradictory legislation, along with the functional reality that many due diligence processes in the allocation of hunting permits and so forth are simply not followed. The report below examines the purported value of trophy hunting to South Africa and strongly suggests that, especially given the obvious and recognised governance challenges, the practice should be abandoned in favour of non-extractive alternatives.

The recognition of these governance challenges is notable because a number of individuals in the 28-member panel are either academics committed to trophy hunting as a means of placing value on animals that would otherwise not be conserved (under the banner of so-called "sustainable use") ('t Sas-Rolfes et al., 2022), or they are members of the wildlife industry that have a vested interest in the continuation of hunting. Stewart Dorrington is the chairman of Custodians of Professional Hunting and Conservation South Africa, which parted ways with the Professional Hunting Association of South Africa (PHASA) over the question of hunting captive-bred lions. The Custodians are strongly opposed to PHASA's endorsement of canned hunting but nonetheless represent a constituency that favours trophy hunting. PHASA, which continues to support captive-bred lion hunting, was

represented on the HLP by Dries van Coller. Mr Deon Swart represented the South African Predator Association, which is essentially a lobby group for the captive lion breeding industry. Hunting interests were also represented by Lizanne Nel, Conservation Manager of SA Hunters and Game Conservation Association, among one or two others.

The paper referenced above by 't Sas-Rolfes et al., a member of the HLP, deals specifically with rhino hunting but makes the following case (p. 1):

"Legal hunting of African rhinos has been sustainable, with very small proportions of populations hunted each year, and greater numbers of both species today in these countries than when controlled recreational hunting began. Terminating this management option and significant funding source could have negative consequences at a time when rhinos are being increasingly viewed as liabilities and revenue generation for wildlife areas is being significantly impacted by COVID-19. Provided that there is appropriate governance, conservation of certain highly threatened species can be supported by cautiously selective and limited legal hunting."

Two things are important to note. First, there is an untested assumption that seems to suggest that the greater numbers of rhinos today than before hunting began is causally attributable to trophy hunting. There is of course no counterfactual positioning, and it may well be that there would have been even more rhino without trophy hunting. And perhaps the fact that numbers have grown in private reserves that do *not* practice hunting is a case in point. Second, the recognition remains that trophy hunting in the absence of appropriate governance is destructive, precisely because it is unlikely to be "cautiously selective and limited".

With regard to elephants, the HLP report notes that of the national population of an estimated 22,222 animals, 4,674 live on privately owned land and a further 3,930 are estimated to live in the agglomeration of private reserves adjoining the Kruger National Park, also known as the Association of Private Nature Reserves (APNR). The report notes, to its credit, that while the elephant population in the assessed region is stable, elephant range is contracting rapidly and a potential threat "may be unregulated trophy hunting. Even though trophy hunting of elephants is limited, and it is unlikely to have a deleterious effect on the population as a whole, large-tusked individuals are in high demand for trophy hunts and these animals are becoming increasingly scarce as a consequence. Regulatory mechanisms are thus required to prevent the over utilisation of large-tusked individuals" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). This point implicitly recognises the issue in the broader debate outlined earlier over the incentive asymmetry at play between private trophy-harvesting interests and public conservation interests. The HLP report also notes another important factor with regard to the history of elephant conservation in southern Africa, which is that in the late 1970s, elephant populations "were recovering from historical lows due to overhunting in the early 20th Century" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). Overhunting is an empirically observed historical phenomenon and the track record is not promising that regulation can prevent it, especially in relation to large-tusked elephants which are increasingly scarce. Individual trophy hunters do not appear to have much regard for whether large-tusked elephants remain in the wild for future generations.

The HLP report similarly recognises that colonial overhunting had decimated the White Rhino population to between 20 and 50 animals by 1895. Although the population has now recovered due to a number of innovative conservation techniques (according to the report), it is still listed as Near Threatened on the International Union for the Conservation of Nature (IUCN)'s Red List. However, conservationists have been at pains to note that intensive breeding on private land is not conservation – larger numbers at the expense of real wilderness is farming, not conservation (Carruthers, 2008). According to the HLP report, "live sales, limited sport hunting and ecotourism have historically provided incentives that helped encourage a significant expansion of range and numbers on private land in South Africa" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). It recognises that the private sector in South Africa now conserves more White Rhinos than the total population of Black and White Rhino in the rest of Africa. Black market prices in Southeast Asia for rhino horn (for various uses) remain high and sustained, though, due to growing and expanding markets. Increased security costs and reduced live sale prices have started to disincentivise the conservation of rhino on private land in South Africa.

Hunting is not credited – in the HLP report – with having been even partly responsible for the recovery of White Rhino numbers from the turn of the century onwards. **The authors note that it was possible to re-introduce limited hunting in 1968 because conservation efforts had been successful.** However, this reintroduction introduced a problem that constantly jeopardises theoretical economic models – the presence of corruption. Pseudo-hunting became a phenomenon that fuelled the rhino horn trade. While it has not been legal to trade rhino horn internationally since 1979, traders have used (and continue to use) the loophole of legal hunting in South Africa to export rhino horn to illegal markets. Black Rhino recovery is, however, attributed to trophy hunting in the HLP report, despite numbers now improving in range states that do not permit the practice, and decreasing in places like the Kruger National Park (KNP).

For Leopard Conservation, the HLP report references two independent simulation models that both project ongoing population decline in South Africa due to "unsustainable rates of persecution (direct and indirect) and a poorly managed trophy hunting industry" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). Another perhaps unforeseen negative consequence of intensive breeding of plains (and exotic) game on private land for trophy hunting in South Africa is the ironic fact, noted by the report, that leopards (and other carnivores) are being persecuted where they are a threat to game farmers' stock. This does not appear to be a conservation success story and indeed appears to be an explicit example of trophy hunting directly harming conservation. In an important 2017 paper published in *Conservation Letters*, Pitman and others make the same point: "We demonstrate that game rancher tolerance towards free-ranging wildlife has significantly decreased as the game ranching industry has evolved" (Pitman et al., 2017, p. 403). While the HLP report is likely correct in identifying direct poaching for leopard skins as a more severe threat than problem-animal control and unsustainable trophy hunting combined, the latter is nonetheless strongly identified. The lack of governance in managing hunting is patently clear: females are being hunted in addition to males, excessive hunting occurs around protected areas and there is "excessive hunting of prime adult males" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020), the same problem identified earlier in relation to wild lion hunting across the continent (Peter Andrew Lindsey et al., 2013). Governance challenges associated with trophy hunting, especially of leopard, remain significant. The HLP report employs strong language in its assertion that "the use of national population estimates to set trophy hunting quotas is perilous" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). Quotas, as indicated above, are meant to be derived from an established MSY. These have either not been established or have not been completed for the species in question. Moreover, for commercial exploitation to be permitted, CITES non-detriment findings (NDFs) have to be in place, but these too depend on some kind of MSY to establish that trophy hunting of a particular species will not negatively affect future population growth.

Governance challenges are clearly systemic across wildlife management departments in all provinces in South Africa. Better governance requires intensive effort, excellent science to inform policy, the crafting of appropriate incentives for conservation, and credible deterrents for destructive practices. It appears from the HLP's own report that South Africa is currently incapable of achieving this level of governance required. Despite noting that excessive females are being hunted; captive-bred leopards are likely being laundered into the trophy hunting industry; and leopards are being caught in the wild for the same purpose, the report still expresses faith that these detrimental impacts might be "reduced by improving current management practices" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). There appear to be few grounds for believing that such improvement is possible under the current structures. Even with good governance, however, it is not clear that other threats to leopard populations could be mitigated. Trophy hunting, in the context of intensive poaching, thus has an additive effect, where poaching effects are exacerbated by trophy hunting. This would not be diminished even if only males were hunted, quotas were set on more realistic numbers and distribution was dispersed more evenly across provinces. This is because both poachers and trophy hunters predominantly target prime males.

This review notes that captive lion hunting, which accounts for the vast majority of lion trophy hunting in South Africa, was widely condemned by the HLP. It is therefore not a primary focus of the review.

Importantly, the HLP report notes that "there are misconceptions of the impact of hunting and photo-tourism, with both activities consuming natural resources and having an environmental impact that has to be determined through full-cost accounting methods" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). Indeed, the requirement for a proper accounting of the costs and benefits associated with both practices – one directly consumptive (trophy hunting) and the other non-consumptive but not without environmental cost – cannot be overstated. Notwithstanding the severe governance challenges articulated in the body of the report, the HLP report nonetheless states that the five iconic species in question are **central to a vibrant hunting industry which "provides high levels of income, at relatively low environmental cost, with opportunities for wildlife-based economic activities in areas that may not be feasible for photo-tourism such as the more arid areas of the North West Province and Northern Cape"** (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). This recommendation appears to contradict everything in the report that cautions against hunting. It also does not acknowledge that trophy hunting is a globally declining industry unable to contribute sufficiently to the full conservation costs of maintaining large intact ecosystems.

The HLP report then indicates that conservation of the five iconic species can be bolstered through applying a variety of business models, including both hunting and photo-tourism in the same area. However, this recommendation evidently overlooks the fact that such a mixed model is already currently practised within some reserves in the APNR bordering the Kruger National Park. A case study of the APNR exemplifies the governance challenges in a

peculiar but important (large) landscape. The body of the HLP report acknowledges the problem of *res nullius* in the Draft Biodiversity Policy, which is the classification of wild animals in South Africa under common law – objects owned by nobody, but which can be owned. In 1996, the western boundary fence of the Kruger National Park with the APNR was removed. Animals that were previously managed and effectively in the state's custodianship were now simultaneously "taken ownership of" by private landowners if they crossed the (now imaginary) border. Inside the APNR there have been numerous instances of misgovernance that have yet to be given a public hearing. For instance, an elephant trophy hunt in Balule went wrong in front of startled photographic tourists and the incident appears to have been swept under the carpet.[2] In another instance, a lion called Skye – a Kruger Park lion at prime breeding age (younger than the permitted hunt age minimum of six years) – was shot inside Umbabat.[3] The reserve has attempted to cover up the incident and nothing has been resolved.

The Draft Biodiversity Policy, cited in the HLP, states that "assigning private ownership for game has acted as an important incentive for conservation, and has resulted in many successful conservation initiatives in the country. There is, however, also a need to ensure that the public interest is safeguarded, and that private and public interests are fairly balanced" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). The balance of the evidence suggests that the public interest is not being safe-guarded in respect of the APNR specifically, and governance issues have plagued the arrangement since its inception (Pickover, 2010).

Despite the above challenges that are not recognised in the HLP report, the HLP nonetheless recommends that the National Biodiversity Economy Strategy be recontextualised to "fully leverage the value of the iconic species as a unique selling point for South Africa, prioritising both responsible photo-tourism **and hunting**" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). In light of the review thus far, the risk is that this strategy will not turn out to be a unique selling point at all but rather value-destructive insofar as trophy hunting is a globally declining industry and photographic tourism is increasingly mutually exclusive to accommodating trophy hunting, especially in the same areas. Moreover, there are increasing calls for trophy hunting import bans from the very nations whose hunters extract animal trophies from their former colonies (the United Kingdom perhaps being foremost among them). Responses to these proposed bans typically entail an assertion that they would damage rural livelihoods (based on work by the likes of Cooney et al., 2017), a claim critiqued in further detail later in this report.

The HLP report goes on to state that "there is a general lack of understanding that responsible trophy hunting has minimal ecological and environmental impact and that it can contribute to conservation and socio-economic development" (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). It is not clear how such an assertion was induced from the available evidence, given that the available evidence strongly suggests that *responsible* trophy hunting is too often a theoretical construct rather than an empirical reality. Moreover, the report selectively notes that the IUCN has developed guidelines for trophy hunting which recognise that hunting can contribute to conservation, without simultaneously recognising that there is a strong debate within the IUCN between the IUCN World Commission on Environmental Law Ethics Specialist Group, and the group that authored the guidelines, the IUCN Sustainable Use and Livelihoods Specialist Group (SULi) (IUCN Global Species Programme, 2017). The report also does not reference the Chardonnet report referenced earlier, which was in fact also published under the auspices of the IUCN.

The Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros

In the wake of the recommendations proposed by the HLP, the Department of Forestry, Fisheries and the Environment gazetted a draft policy position which established 10 primary challenges confronting South Africa's conservation

2 Lombard Steyn L, 'Young elephant shot 13 times: Tourists watched in horror', Getaway Magazine, 3 April 2019, https://www.getaway.co.za/travel-news/young-elephant-shot-13-times-tourists-watched-in-horror/, accessed 26 August 2021.

3 Pinnock D, 'Parliament slams Kruger Park for defying directive not sign agreement with neighbours', Daily Maverick, 12 February 2019, https://www.dailymaverick.co.za/article/2019-02-12-parliament-slams-kruger-park-for-defying-directive-not-to-sign-agreement-with-neighbours/, accessed 26 August 2021. See also Pinnock D, 'Digging for the truth about Skye', Daily Maverick, 5 July 2018, https://www.dailymaverick.co.za/article/2018-07-05-digging-for-the-truth-about-skye/, accessed 26 August 2021.

reputation. The only challenge articulated in relation to trophy hunting specifically is: "Unsustainable practices on hunting of wild leopard" (Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros, 2021).

The policy objectives articulated in the draft policy position paper are largely to be commended, especially the proposal to put an immediate halt to the domestication of lion and the commercial exploitation of captive lions and establish a process to close captive lion facilities. A similar intervention is proposed in relation to rhino management.

One of the more controversial aspects of the policy paper is its call to "reposition South Africa as a destination of choice for legal, humane, regulated and responsible hunting of the 5 iconic species" (Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros, 2021). As Don Pinnock, a criminologist and investigative journalist, rightly pointed out after the paper's release, however, the immediate issue is that such "ethical" hunting remains undefined.[4] The position paper asserts, quoting verbatim from the HLP report, that the five iconic species are "central to a vibrant international hunting industry". It goes on, though, to assert that "hunting is a part of the South African heritage and culture, and generates economic benefits as part of the South African rural economy" (Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros, 2021). It would appear that this assertion is based solely on the work by Saayman et al (2018).

Full-cost accounting of the pursuit of even "ethical" trophy hunting is clearly necessary. The same section of the draft policy paper notes that, "International wildlife-based tourists are discerning, and there is competition among destinations, with increasing importance to demonstrate that experiences are authentic, responsible and sustainable" (Draft Policy Position on the Conservation and Ecologically Sustainable Use of Elephant, Lion, Leopard and Rhinoceros, 2021). While the HLP report recognises that the domestication of wildlife poses a direct risk to such a conservation reputation, it fails to recognise that trophy hunting endorsement may constitute that very same risk.

Given that the policy paper includes as its expanded definition of sustainable use (the guiding principle on which wildlife management policies are built), a stipulation that sustainability necessarily considers "the social, economic and environmental impacts of activities collectively, including disadvantages and benefits", an examination of the literature pertaining to the costs and benefits of trophy hunting in South Africa is now required.

The economic impact of trophy hunting in the South African wildlife industry

In a 2018 paper referenced in the HLP report, Melville Saayman, Petrus van der Merwe and Andrea Saayman suggest that, using multiplier analysis, "trophy hunting annually contributes US $341 million to the South African economy and that it supports more than 17,000 employment opportunities" (Saayman et al., 2018). Absent the multiplier effect, the amount spent per annum is $250 million. A "multiplier" effect in economics is simply the extended impact of one unit of currency spent. For instance, if a hunter spends $10,000 to shoot an animal, that money cycles through various sectors – tourism, agriculture, taxidermy and so forth. The point is to argue that the benefits are essentially more extensive than they may appear at first glance. The remainder of this review will evaluate the paper and the quality of the claims in the Saayman et al. paper.

Saayman et al. differentiates between trophy hunters and biltong hunters. Trophy hunting is defined as "an activity where wildlife is hunted by means of a rifle, bow or similar weapon primarily for their horns (measured according to Rowland Ward and Safari Club International measurements) and/or the skin in order to be displayed as trophies" (Saayman et al., 2018).

The authors are correct to identify that, in the South African context, trophy hunting has not been extensively researched, although it attracts considerable media attention.[5] They point to Peter Lindsey as the main contributor to scholarly work on the economic value of hunting to southern Africa, which is indeed accurate, but the majority of this work (P Lindsey et al., 2012; PA Lindsey et al., 2007; Peter A. Lindsey et al., 2006; Miller et al., 2016; Nelson et al., 2013) does not focus specifically on South Africa, except for the assessment

4 Pinnock D, 'A matter of pride: South Africa proposes banning intensive breeding of lions and rhinos – and ending captive lion hunts', Daily Maverick, 28 June 2021, https://www.dailymaverick.co.za/article/2021-06-28-a-matter-of-pride-south-africa-proposes-banning-intensive-breeding-of-lions-and-rhinos-and-ending-captive-lion-hunts/, accessed 26 August 2021.

5 (Fassbender, 2016, p. v)

of the economic, social and conservation value of the wildlife ranching industry and its potential to support the green economy in South Africa (A. Taylor et al., 2016). Saayman et al. rightly note that the limitation of the Taylor et al. study was that it sampled only 251 respondents and did not include a full accounting of money spent by hunters all along the value chain (the 'multiplier' effect).

To their credit, the authors state that their study makes no judgment on whether trophy hunting possesses conservation value or not; they are trying to ascertain only the economic value that it generates. The HLP report and the resultant draft policy paper both seem to presuppose, though, that trophy hunting is a justifiable *conservation* tool precisely on the grounds of the *economic* benefits it purportedly produces.

Before explaining their methodological approach, Saayman and his co-authors reference the controversial 2015 study commissioned by Safari Club International (SCI), which "established that the impact on the economies of southern African countries ranges from US$344.5 million in South Africa to US$1 million in Tanzania", presumably per year (Saayman et al., 2018). Despite both the 2013 and 2017 Economists at Large studies being available, neither are referenced or acknowledged as having disputed these figures. Moreover, Saayman and his co-authors, as indicated above, do not acknowledge Chardonnet's study either.

Methodological Difficulties

The first major difficulty with a study of this nature is that there appears to be no checks and balances to ascertain, in the first instance, whether the respondents truly were trophy hunters. The mere fact that the survey was posted on the SCI and PHASA websites respectively does not in itself guarantee this. The authors may have taken steps to verify the validity of responses, but this is not communicated in the paper if indeed it was carried out.

The second challenge is one that afflicts all survey research – self-reporting. Readers are inadvertently asked to trust that the respondents can accurately recall their expenditure on a hunting trip. Over and under-reporting are risks, but respondents – if verifiable hunters – have a vested interest in the continuation of the trophy hunting industry and might therefore be biased towards over-reporting the value of their activity. The authors do not acknowledge this challenge.

Third, the authors assume that survey respondents – only 362 of the total population of 7,600 – all spent the average amount compiled from the survey; average expenditure is derived from the sample and applied without weighting to all 7,600 hunters from the 2015/16 season. This overlooks the fact that those who were willing to respond to the survey were likely to be those most interested and therefore may spend disproportionally more than those who did not respond.

The authors do acknowledge the threat of "negative perceptions and unethical behaviour, such as canned hunting (where a predator is shot in a confined space where there is no chance for a fair chase)" (Saayman et al., 2018). Nonetheless, the fifth methodological issue, and perhaps most important, is that the paper does not consider the opportunity costs of trophy hunting in South Africa. Economists should always consider these. Opportunity costs represent those opportunities that are foregone when any given economic activity is chosen. In other words, if a particular land-use option is chosen – game-ranching for the ultimate purpose of deriving revenue from trophy hunting – then that land cannot be used for alternative purposes. The common narrative is that ecological diversity has flourished in South Africa as a result of this economic option being made available through private game ownership. This assumption remains untested, however, as indicated earlier. In the very simplest formulation, it does not consider that the land may otherwise have been joined up to reduce the ecological costs of fragmentation and allow migratory corridors to be established, which would likely be conservation-enhancing (Douglas-Hamilton et al., 2005; Jackson et al., 2016; Pittiglio et al., 2012). Joined-up landscapes may generate larger revenues than trophy hunting through increasing ecotourism options and ensuring that ecological integrity (the ultimate bedrock of tourism and, ironically, sustainable trophy quality) is created and maintained where it may currently be absent. The paper also doesn't account for the direct harm caused to certain wildlife populations such as leopards, who are not allowed to use the land being used by game ranchers, and are often shot on sight. This is a devastating opportunity cost associated with the proliferation of game ranching (Pitman et al., 2017).

Another significant opportunity cost of the continuation of trophy hunting, especially of the five iconic species in question, is the risk that tourists will increasingly boycott countries that continue to pursue trophy hunting. Saayman himself has been involved in studies that conducted research on the value of the Big Five for South Africa (van Tonder et

al., 2013), but does not recognise in the study under scrutiny here that trophy hunting does not occur in isolation from the broader global debates that increasingly frown upon trophy hunting on ethical grounds alone (Batavia, Bruskotter, et al., 2019; Batavia, Nelson, et al., 2019; Mkono, 2019).

Sixth, the study claims that the "total impact of trophy hunting on the South African economy is US$341 million" (Saayman et al., 2018). If accurate, as a proportion of total tourism expenditure in 2019 (the last pre-Covid figures) – worth US$17.9billion – trophy hunting represents about 1.9% of the total tourism value to the country. The 17,000 "employment opportunities" claimed in the study represent only a tiny proportion of the 1.46 million jobs generated through tourism in 2019. In context, the total value, including multiplier effects, is miniscule even if one overlooks the methodological challenges to the study. Chardonnet reports that total turnover from hunting in Botswana (prior to its 2014 moratorium) was only 20 million USD/year. In 2017 (a useful marker year because of the natural experiment referenced earlier), "Botswana generated a turnover of 687 million USD from tourism for 26,000 direct jobs" (Chardonnet, 2019, p. 38).

Cameron Murray raises similar concerns in his critique (referenced earlier) of the SCI 2015 study and there appears to be no scholarship to date that disputes his findings that the purported marginal benefits of trophy hunting have been overstated.[6]

The final obstacle to the study's usefulness in relation to the HLP findings and continued insistence on trophy hunting as a conservation tool (if well governed) is that it does not indicate which animals generate the most (or least) revenue from hunting. We are left none the wiser as to what elephant trophy hunting is worth, for instance, in comparison with buffalo hunting or even of the lower-value or no-cost species. If 47% of average expenditure per trophy hunter is on 'game', then it is critical to know exactly which animals are most valued by hunters.

Saayman et al. conclude that their research "could contribute towards the debate on the link between hunting and conservation" as private ranching and hunting have "led to the country having a greater stock of wildlife compared to 100 years ago" (Saayman et al., 2018). This reveals a rather simplistic view of what conservation is, however – farming the wild rather than wilding the farm. The authors appear to equate conservation success with stock numbers. This reveals an inadequate sense of the conservation costs of private ranching, detailed in at least two very important papers (Pitman et al., 2017; J. Selier et al., 2018). It also reveals a tendency to make blanket assertions that trophy hunting benefits lower-income communities in rural areas. A number of papers also question the extent to which game farming and trophy hunting have benefited previously dispossessed South Africans. The findings are not promising (Brandt, 2016; Carruthers, 2008, 2016).

Conclusion

In a world increasingly at risk of catastrophic climate events, the economic value of maintaining intact carbon landscapes cannot be overstated (Chevallier & Milburn, 2015). Where the trophy hunting of some of South Africa's iconic species (and others), predominantly on small private reserves, may perpetuate the fragmentation of landscapes that could otherwise be joined together, the practice should be reconsidered. Moreover, conservation reputation will become increasingly valuable concomitant with the growth of ethical tourism, which views trophy hunting as incompatible with ecotourism.

At present, the HLP report and the Draft Policy paper are endorsing trophy hunting of elephants, lions, rhino and leopard on rather flimsy empirical evidence of hunting's value. A significant unanswered question is exactly what proportion of Saayman et al.'s calculation of $341 million is specifically attributable to the five species in question. Until such time as that question is answered, it seems premature at best to pursue the trophy hunting of these iconic species. This is especially the case if the governance issues that the HLP correctly identifies (along with other important papers) are not resolved (and they do not look as if they can be resolved any time soon). It appears prudent, therefore, to consider a moratorium on the trophy hunting of these species until such time as a more robust study is undertaken.

The report below answers some specific questions that further substantiate the policy recommendation of a moratorium on trophy hunting in South Africa for the species in question.

6 Google Scholar indicates that the study by Cameron Murray has been cited ten times to date. Searching within those studies reveals no attempt at disputing Murray's revised figures.

1. IN WHAT TYPE OF SYSTEMS DOES TROPHY HUNTING OCCUR IN SOUTH AFRICA?

Compare and contrast:
a) Species
b) Stakeholders

Trophy hunting in South Africa occurs across a relatively broad range of land ownership systems. It appears from the available literature, surveyed above, that most trophy hunting is accounted for by private land ownership. A significant portion of trophy hunting also takes place on communal land – land that is currently under insecure communal tenure (for which no formal property rights exist and land allocation is subject to the whim of the local chief) in the former homelands, which is often adjacent to national parks. Some of the governance challenges associated with trophy hunting in these types of systems are elaborated later in the report.

A large proportion of the more controversial trophy hunting in South Africa (especially of elephants and lions), occurs within the Association of Private Nature Reserves (APNR), an agglomeration of private land parcels connected to each other and to the Kruger National Park on its eastern boundary. As indicated in the literature review, the governance challenges associated with trophy hunting in South Africa appear to be most prevalent within this particular (and peculiar) system. In a recent socio-economic assessment of the greater Kruger area, it was estimated that trophy hunting (of all species) supports a total of 135 jobs; adds value of R33.5 million to the country's GDP; generates taxes of R4.6 million and income of R15.6 million, the majority of which presumably accrues to the wealthy landowners and not to local communities. Leisure tourism (non-consumptive) in the same area, by contrast, supports 18,724 jobs, adds R2.3 billion worth of value to GDP; generates income of R4.7 billion and contributes R698 million in taxes.[7]

The map opposite provides a cursory first step towards visualising the geographic areas in which trophy hunting occurs in South Africa. Stakeholders vary according to the type of land ownership in question. In communal lands, local communities are meant to be the primary stakeholders and beneficiaries. In the APNR, surrounding communities are meant to benefit from trophy hunting but most of the benefits appear to accrue directly to the landowners, hunters, hunting outfitters and related industries such as transport, accommodation, and taxidermy. In purely private jurisdictions, the stakeholders appear to be only the landowner and the employees.

Notes on the data gathered thus far:

- There is no single directory that exists from which to draw sound information to populate the map. The PHASA shows its membership list, but it is not up to date and has a mix of individual hunters and farms. There are a few sites which gave a list of what seem to be the most popular farms.
- Many of the farms listed are duplicated across provinces. Some lodges own land in all nine provinces. Some also seem to share property, but this will be confirmed once geolocations are inserted (a project in progress).
- A cross check is needed to confirm that each farm on the list does in fact hunt protected species. This was difficult to check initially because of the sheer number of farms found to date. The majority on the list hunt all the animals within the Big Five, which includes threatened species.

2. THE AMOUNT OF MONEY MADE FROM TROPHY HUNTING

What amount of money is made?

A. How are these estimates arrived at?

Reliable data on the economic significance and conservation benefits of trophy hunting within South Africa are limited, which engenders a lack of trust in public policy decisions that support trophy hunting as a conservation tool. The industry lacks a strong body of recent peer-reviewed literature, especially regarding its economic impact. The only recent study is by Saayman et al (2018), which, as mentioned above, uses multiplier analysis to estimate the "total impact of trophy hunting on the South African economy [to be] US$341 million", a figure markedly larger than direct spending on items associated with hunting tourism, which were estimated at US$214.8 million (2018, p.5). The authors further argue that 9% of all income earned from trophy hunting accrues directly to low-income households.

7 These figures are from a presentation based on Chidakel, Eb and Child (2020).

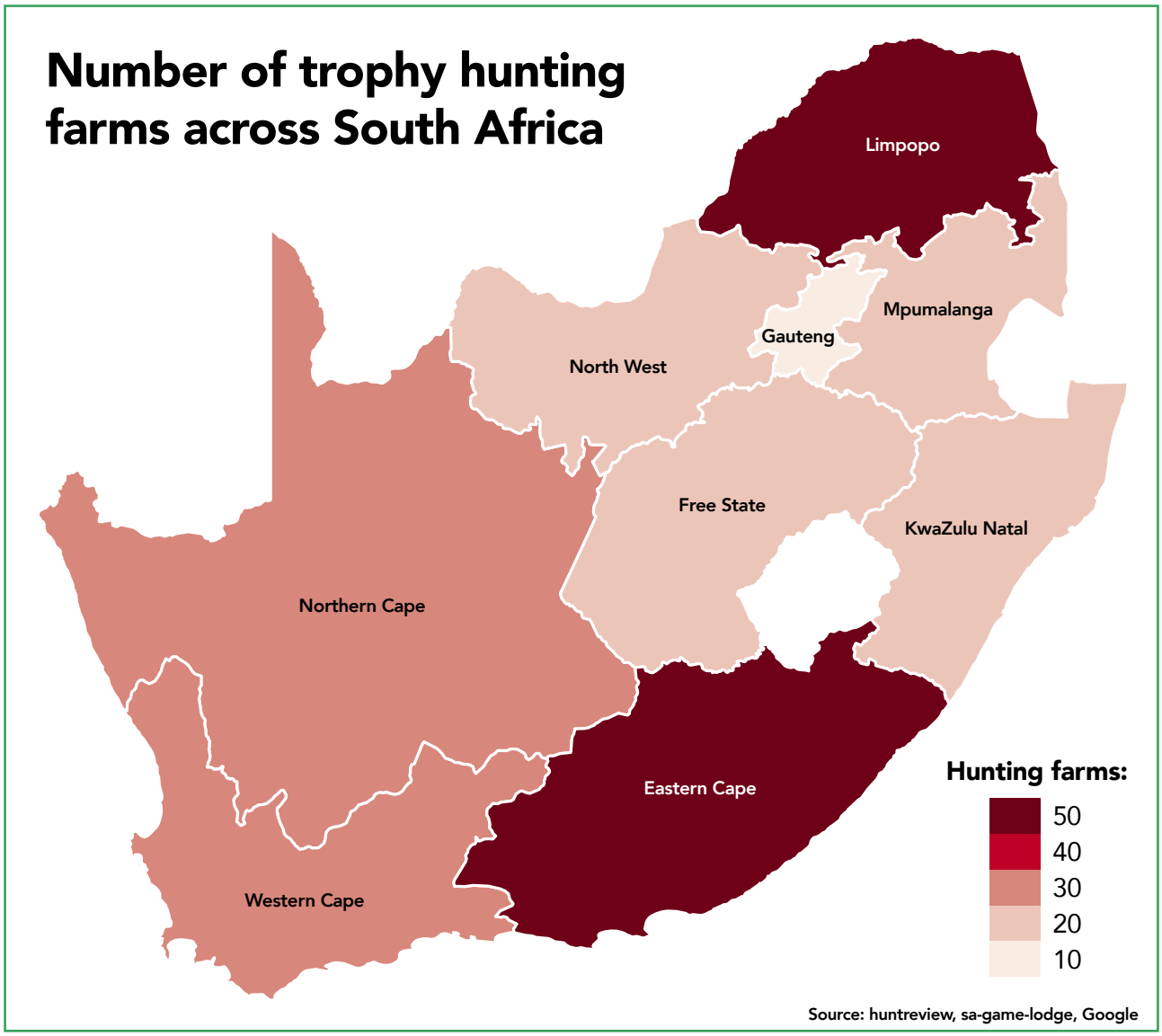

Figure 1: Number of trophy hunting farms across South Africa

Prior to the release of this paper, the Tourism Research in Economic Environs and Society (TREES), at which the authors of the Saayman et al. study also work, in collaboration with the Professional Hunter's Association of South Africa (PHASA), released a 2017 marketing and spending analysis of trophy hunting and a breakdown of revenue generation from the trophy hunting industry (Van der Merwe, 2017). The goal of the study was to understand and determine trophy hunters' spending patterns as well as to estimate the economic impact of trophy hunting on South Africa. The study was conducted based on the data of 362 hunters from their database.

According to the TREES study, the economic impact of trophy hunting is categorised by several costs not associated directly with hunting but are part of the overall activity. These are namely (excluding hunting): transport within South Africa (not included in daily fees); transport to SA; spending on SA Airlines; average daily rate; aspects not in daily rate; ammunition; clothing; hunting gear, excluding ammunition; shipping costs; trophy handling; licenses and permits; and additional tours and travel costs. The highest expenditure categories for general spending (excluding hunting) are:

- Transport ($5 068.90/R65 895.70), (to South Africa).
- Daily rates ($3 602.96/R46 838.48) – ($310,60 x 11.6 nights = $3 602.96; the 11,6 nights is the average length of visit per respondent).
- Shipping costs ($2 857.87/R37 152.31).

The overall spending that directly contributes to the species hunted are as follows:

- Approximately $3 744 915.00 (R48.7 million) spent by hunters in South Africa on game species they hunt.
- The average amount spent on game species per respondent per season is $10 345.07 [$3 744 915/362 (number of respondents) = $10 345.07/R134 485.91)].
- The average spending of trophy hunters including game hunted and general spending in South Africa amounts $20 135.51 (R261 761.63) (excluding travel cost to SA $5 068.90). If this is multiplied by the number of respondents (362), it amounts to $7 289 054.62 (R94 757 710.06).

The total contribution to the South African economy is estimated at:

- $130 880 815.00 (7 600 hunters x $20 135.51) or R1.989 billion (R1 989 388 388.00).
- Trophy hunters spend a total of R1 02 billion (R1 022 092 916.00) on game hunted (7 600 hunters x R134 485.91) and R967 million (R967 295 472) on general aspects (7 600 x R127 275.72).

This figure of US$130.89 million is substantially different to the figures reported in the Saayman et al. 2018 peer-reviewed study produced by the same research unit. The discrepancy is difficult to understand. The 2017 TREES questionnaire was distributed by PHASA to hunters whose details were captured on the PHASA database. The 2018 paper reported results from the same survey distributed to Safari Club International (SCI) and PHASA members. But both reports indicate that 362 questionnaires were completed from October 2016 to June 2017. How different results are derived from what appears to be the exact same survey is not apparent (or transparent).

According to the TREES study, the top 10 income earners per species in the 2015/16 season were as follows:

- Buffalo
- Lion
- Sable
- Kudu
- Nyala
- Gemsbuck
- Zebra Burchell
- Waterbuck
- Eland
- Blue Wildebeest

The 2018 study (based on the same survey) does not reiterate this breakdown. Critically for this report, in light of South Africa's proposal to elevate the importance of trophy hunting of elephant, lion, giraffe, leopard and white rhino, that – aside from lion, most of which are captive-bred – these species do not feature in the list of top income earners. Leopard earned a mere US$30,500, which renders it difficult to warrant a public policy decision to continue hunting the species, especially given its vulnerability (Balme et al., 2009; Braczkowski et al., 2015) and the fact that many private game farm owners (who often double as self-appointed conservationists) persecute them. Hunted elephants earned only an estimated US$100,500. This is a miniscule amount compared to what an elephant earns in potential ecotourism value over its lifetime (Platt, 2014) and its increasingly recognised value towards ensuring the health of carbon sink landscapes (Berzaghi et al., 2019). Moreover, given that bull elephants are increasingly reproductively successful with age, and have a significant impact on herd sustainability, knowledge transfer and discipline of younger bulls (Allen et al., 2020; Lee et al., 2011; R. Slotow & Van Dyk, 2001; Rob Slotow et al., 2000; L. A. Taylor et al., 2019), their loss seems too high a price to pay for the sake of a mere US$100,000 per season in an industry that is literally dying (Chardonnet, 2019) because of lower elephant densities and the increasing frequency of smaller tusk sizes (Chiyo et al., 2015), itself due to the negative impacts of poaching and trophy hunting (Schlossberg et al., 2019). Rhino (southern white) earned US$40,500. Again, given unprecedented levels of recent poaching of rhinos, on both public and private land, it appears difficult to justify a policy decision to make rhino available for trophy hunting. Moreover, very few wild lions are hunted for trophy acquisitions. Those have been highly controversial, as indicated in the literature review. Most lions shot as trophies in South Africa are of captive origin, the ethics of which are questionable at best, and likely damaging the country's conservation reputation and therefore undermining potential tourism income (R. G. Harvey, 2020). Lions, according to the TREES research, earned US$391,200, though it does not distinguish overtly between captive origin and wild lions. Finally, giraffes accounted for US$41,600.

The total estimated combined revenue earned for elephant, giraffe, lion, white rhino and leopard amounts to US$604,300 (but not extrapolated from the direct responses to apply to the total population). This is a miniscule sum in light of overall tourism revenue figures indicated above. It is

also an indication that the vast majority of these rents flow into the hands of already-wealthy elite landowners.

If we assume that 3% of this earning (Murray, 2017) accrues to local communities – a subject examined below – then this amounts to an estimated US$18,129, which hardly seems a justifiable amount on which to justify trophy hunting as an activity that benefits the poor.

If this revenue (the $604,300) entails opportunity costs similar to or exceeding this value, then on pure economics alone it would be difficult to provide a policy argument in favour of allowing trophy hunting of the species examined by the High Level Panel (The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, 2020). In 2004, a study cited by Pickover estimated that "ecotourism on private game reserves generated more than 15 times the income from livestock or game rearing or overseas hunting and created more jobs, while an *Africa Geographic Investigation* showed that photographic safaris generate more than 12 times as much in staff salaries" (Pickover, 2005, p. 18). This points to the need for a rigorous cost-benefit analysis that truly accounts for opportunity costs of continued trophy hunting before endorsing it as a policy option for the future of South Africa's conservation strategy for these iconic species.

The only assertion offered in defence of the continued trophy hunting of the species in question is that the revenue earned funds conservation in ways that would not otherwise be available. However, it is far from clear that even the industry's own studies provide evidence to substantiate this claim in South Africa.

B. Is the methodology used economically sound?

In addition to the questionable numbers above, and the unexplained disparity between what was reported in the 2017 TREES paper and the 2018 Saayman et al. paper, the methodology by which the numbers of the latter have been derived appears vulnerable to significant criticism. The authors' own contention is that multiplier analysis is normally used to determine the secondary effects – indirect and induced – of a particular economic activity. The multiplier measures the ratio of the change in economic activity relative to the change in spending. Saayman et al. (2018) cite (in support of their employment of a multiplier analysis) a study by Dwyer in which argues that in "economies with high unemployment and small capital constraints" it is "more reasonable". However, it is unclear as to how the authors arrive at the conclusion that the South African economy is characterised by "small capital constraints" or exactly what multiplier analysis is more reasonable *than*. That is, in relation to what, exactly, is it more reasonable? The authors nonetheless use the 2012 Social Accounting Matrix developed for South Africa in 2016 to determine the 'full' economic impact of trophy hunting, though – as indicated in the literature review above – the opportunity costs were not mentioned.

Aside from the difficulty of using trophy hunters' self-reported expenditure figures – hunters have a vested interest in inflating the numbers if they believe that it will help to defend the industry – multiplier analysis itself is typically subject to abuse,[8] which is not necessarily the fault of those who conduct them, but the limitations should always be clearly articulated.

Multiplier analysis does not, for instance, address questions related to the feasibility of an activity. Resource constraints, similarly, tend to be ignored. This is very much the case in arguments used to defend trophy hunting in South Africa. Actual modelling of how trophy hunting is likely to affect population growth dynamics among vulnerable wildlife populations (limited available 'resources') is absent from the current literature. Moreover, increasingly scarce 'stock' may result in an increase in prices, which is also typically ignored in multiplier analyses. Regarding employment, there is a subtle implication in the Saayman et al. model (and in many other multiplier analyses) that the employment effect of expenditure growth is necessarily local, overlooking the fact that skills are often imported from other regions for specific activities. The direct job impact for trophy hunting appears to be seasonal at best and the indirect employment benefits (for related industries such as outfitting and taxidermy, etc.) seem unlikely to accrue to the unskilled and currently unemployed. Finally, the potential negative effect (negative externalities) of an activity such as trophy hunting on related or affected industries and residents is also largely overlooked in multiplier analyses. In other words, where trophy hunting may explicitly damage local ecotourism potential (especially

8 See Hughes (2020).

where animals like lion and elephant are shot in their prime and are simultaneously the creatures prized by photographic tourists), the costs of this damage do not enter the multiplier modelling equations.

C. Is the amount significant in comparison to GDP and other non-consumptive sources?

Trophy hunting industry income in South Africa was estimated at £71.8 million in 2013 (Economists at Large, 2013). In 2006, Lindsey et al. had estimated the figure at $112 million USD (2007). In 2012, the World Travel and Tourism Council estimated that South Africa's total tourism income was ZAR102 billion (£5.5 billion, or $8.58 billion USD), employing 10.3% of the population and making up 2.3% of the country's GDP. Trophy Hunting in South Africa represented around 1.2% of all tourism revenue, with Trophy Hunting revenues making up less than 0.02% of the country's GDP. These figures are outdated but still show the miniscule comparative contribution of trophy hunting to South Africa's tourism industry.

If trophy hunting was worth $130.8 million in the 2015/16 season (Saayman et al., 2018), then – as a proportion of total tourism income recorded for 2019 (US$22,1 billion), and assuming that the amount had not declined significantly in 2019 – the industry is now worth only 0.59% of overall tourism income (prior to the impact of Covid 19 on travel and tourism).

If elephants, rhinos, leopards, lions and giraffes constitute a relatively small proportion of the estimated overall $130.8 million economic contribution of the trophy hunting industry to South Africa, then policy practitioners must ask whether such minimal value is worth the potential negative reputation and conservation effects of hunting these species. This is especially the case if proper governance is absent, as it appears to be (Bloom, 2021). Even scholars who promote trophy hunting (in some instances) recognise that sound governance is a necessary condition for its 'success' ('t Sas-Rolfes et al., 2022; Nelson et al., 2013).

Increasingly, tools from the economics discipline are credibly demonstrating that wildlife species are worth far more alive than dead, both to their ecosystems and to the tourism industry (Chami et al., 2019), a subject addressed in more detail in the last part of this report. As indicated in the literature review, it is also increasingly clear that extractive (colonial) activity is incompatible with ethical ecotourism.

Wiggins (2015) reported, for instance, that a black rhino was auctioned by the Namibian government to be hunted for US$224,000 in 2014. Given that the black rhino population at the time was 5,055, this would have rendered the entire population worth US$1.77 billion in trophy hunting terms. However, because tourists can view the same animal multiple times, its non-consumptive value is likely far higher than its hunting value (especially if key species such as lion are being shot at the point at which they are most reproductively fit). By way of example, a 1986 African lion (in full mane) viewing was estimated to be worth US$905,000. Walter Palmer paid a mere US$55,000 to shoot the lion known as Cecil in Zimbabwe.

Moreover, the governance questions associated with how annual trophy hunting quotas are set have not been answered, as indicated in the literature review. Pinnock (2021) reported that in October 2021, for instance, the Department of Environmental Affairs proposed hunting and export quotas for elephant, black rhino and leopard hunting trophies via a press release with no substantiating science.[9] But no information was provided as to how these quotas were set and the proposal "ignores the recommendations of a High-Level Panel policy paper which currently under review on the welfare and use of those three species, as well as lions". Pinnock rightly notes that setting quotas in this manner not only pre-empts but also undermines the recommendations of the Department's own Draft Policy position referenced in the literature review.

To make matters even more dubious, a report by Kevin Bloom strongly suggests that the South African government should reconsider its hitherto unequivocal support for the trophy hunting industry (Bloom, 2021). Seven elephant bulls belonging to the Kruger Park (or, the people of South Africa) were recently shot by the Limpopo Economic Development, Environment and Tourism (LEDET) department in the Phalaborwa area, as the fence between the park and the local community had not been maintained. According to the *Daily Maverick's* investigation, this is a common occurrence. At face value, the destruction was a result of the collapsed fence. Upon further exploration, it turns out to be the result of a significant governance deficiency in which the Kruger

9 See https://www.dffe.gov.za/mediarelease/creecy_huntingandexportquotas, accessed 15 March 2022.

fence was dropped without consulting the local community at all. LEDET, in 2015, stopped the benefits accruing to the Mthimkhulu community and gave the land rights, unilaterally and without notice, to the Mabunda Traditional Authority, through an agreement signed by chief Pheni Cyprian Ngove, who did not even live in the area. Aside from the questionable reallocation of the land and the trophy hunting rights, the latest quota inexplicably increased the number of animals eligible to be shot. The elephant quota numbers increased from 11 in 2020/2021 to 23 in 2021/2022 without any substantiating evidence being provided.

The *Daily Maverick* report goes on to detail a scam perpetuated by a corrupt hunting outfit (beyond the scope of this report); suffice to note that trophy hunting appears to be of limited economic and conservation value, and prone to governance shortfalls. This is hardly the first investigation to recognise the problem, and the way in which the Associated Private Nature Reserves (APNR) are governed in terms of their relationship with the Kruger National Park and hunting arrangements have long been a source of contention (Pickover, 2010, 2017).

Finally, according to a 2019 study, 90,000 jobs are estimated to be currently attributable to non-consumptive biodiversity use in South Africa (Driver et al., 2019). It is not clear from this study what the labour absorption rate per hectare is, but if we assume that this is derived predominantly from protected areas that forbid hunting – a total of roughly 9.76 million hectares of terrestrial protected area – then the labour absorption figure is 0.009221311 per hectare. If the 21 million hectares currently allocated towards consumptive trophy hunting were reallocated towards non-consumptive tourism (assuming uniformity for the sake of the calculation), approximately 193,647 jobs could arguably be created. That is approximately 11.39 times more than what trophy hunting currently supports (17,000 "job opportunities", according to Saayman et al (2018)). Even if the median labour absorption figure per hectare for ranching and hunting combined is closer to 0.0038, as suggested by Taylor et al (2016), non-consumptive tourism appears to still be 2.43 times more effective at creating jobs.[10] Those jobs are, by definition, more sustainable because they rely on ecosystem health and wildlife longevity as a necessary condition for their sustenance.

3. THE BENEFICIARIES OF THIS MONEY

Who or what entities receive this money?

If it is claimed that trophy hunting contributes to government revenues in South Africa, at the national and provincial level:

- **How much?**
- **At the property level?**

And how do these sums compare to total amount spent on conservation?

No research currently exists to indicate what proportion of trophy hunting's total purported value in South Africa is allocated to which entity. In other words, it is not anywhere formally documented who receives exactly which benefits. Furthermore, what amount of tax revenue accrues to the state from trophy hunting at the national level (which would then be disbursed to the provincial and municipal level) is not documented either. At a state level, the total amount of South Africa's budget spent on conservation in 2014/15 was R10 billion, a mere 0.7% of the overall budget in that year. Nonetheless, of this R10 billion, we are unable to discern how much is derived from taxes paid directly by hunting and hunting-related industries.

The Associated Private Nature Reserves (APNR) are slightly different from other types of land ownership mentioned in part one in that they are a set of privately owned concessions, but there are no fences between the individual properties or the neighbouring Kruger National Park. The result is that animals belonging to the public (Kruger animals) are shot in the APNR under a legal loophole called *res nullius* (no one's animals), which renders Kruger animals essentially private once they cross the fence. Wealthy landowners then benefit from trophy hunting revenue, the killing of animals for which they did not pay in the first instance, and to which they lay doubtful ownership claims.

Incentives for habitat conservation derive mainly from revenue-sharing agreements between rural communities, private enterprises, and conservation agencies, as well as direct payments to private landowners. The trophy hunting

10 These calculations are contained in Harvey (2003) and (2019) in submissions made to the UK Department of Environment, Food and Rural Affairs (DEFRA) during its process of assessing the merits of legally prohibiting the import of hunting trophies into the United Kingdom.

market in South Africa, where almost all the land is privately owned, ostensibly provides farmers and ranchers with incentives to convert agricultural lands to wildlife habitat (P. A. Lindsey et al., 2007; Saayman et al., 2018; Semcer, 2019), though the ecological health and conservation of this land is in question, especially given the propensity of some game breeders to persecute predators (Pitman et al., 2017).

In South Africa, there are approximately 21 million hectares of land devoted primarily to wildlife management, comprised of 9,000 private ranching farms, according to Saayman (2018). These lands contain approximately 12 million head of game, twice the number found in South Africa's national park system. As far back as 2005, Michele Pickover noted that there were at least 5,500 private game farms and 80% of their income was linked to hunting (Pickover, 2005). The industry has clearly grown significantly due to the hitherto lucrative nature of trophy hunting (for the landowner). It is important to note here, however, that mere numbers are not indicative of ecological health. Moreover, it appears that many ranches are farming the wild rather than wilding the farm, to borrow a phrase from Jane Carruthers (2008) and potentially perpetuating land ownership inequality under the guise of South Africa's "conservation success story" (Brandt, 2016).

At the property level, prices for hunts vary significantly, from hundreds of dollars to hundreds of thousands.[11] Often, landowners and managers will negotiate with "hunting operators" to determine who is allocated hunting rights or "concessions" on their land, and on what terms. The operator is then able to secure contracts with clients overseas and organize hunting trips. Through the management of wildlife, these landowners are able to generate approximately US$1.6 billion in income each year from the sale of trophy hunts and game meat derived from those hunts, according to Catherine E Semcer's testimony before the US House Natural Resources Committee on the "CECIL Act" (Semcer, 2019).[12] The undated reference Semcer offered in relation to this figure no longer exists but appears to be a presentation by Wildlife Ranching South Africa, an industry body with an interest in upholding trophy hunting in South Africa.

A paper by Taylor et al. (2016) indicates that there are 122 properties in South Africa conducting trophy hunting, of which only 57 provided figures to the authors of the study for numbers of trophy hunting clients hosted per year. From the figures provided, the report indicates that the median number of trophy hunting clients per year was 20; hectares covered by those ranches was 510,724. The authors extrapolate from the available data that 130,186 animals are hunted for trophies on all wildlife ranches in South Africa on average per year, a number "three times higher than the trophy hunting numbers compiled by the then Department of Environmental Affairs in their annual statistics" (A. Taylor et al., 2016, p. 34). Of the properties surveyed that provided data, it appears that none were actively hunting elephant, rhino, lion, leopard or giraffe, though these are listed under 'other species' and not contained in the main pie chart – a confusing distinction.

The prices paid by the hunter typically include the following:

- The operator's costs (where applicable);
- Payment to the local entity (community, private or state landowner/manager) with which the operator has the contract;
- 'Official' government payments of various types which are, at least on paper, meant to help finance wildlife management and conservation activities.

In developing countries, typically 50-90% of the net revenues (exclusive of operator costs) are allocated to the local entity, with the remainder going to the government authority. Local communities can benefit on rare occasion, as the Mthimkhulu community near Phalaborwa had apparently been doing from lawful trophy hunting until 2015 before governance collapse occurred (Bloom, 2021). Bushmeat from the hunts is often contributed or sold to local community members and is, according to controversial research, highly valued locally (Naidoo et al., 2016). The authors of this study made the claim that in communal conservancies in Namibia, 64.3% of communities benefit from hunting activities. However, this research – along with a number of others in the literature – has been recently criticised on the grounds that authors often have vested financial interests in the continuation of trophy hunting and use "perhaps questionable shadow-pricing methods to create equivalence between different kinds of meat, through equalising the value of 'wild meat' distributed from animals hunted in the conservancy with the price of buying meat produced through commercial farming" (Koot et al., 2020). Indeed, it is clear

11 See https://phasa.co.za/wp-content/uploads/2018/05/IUCN_Information_for_press_release_Apr_2016.pdf, accessed 12 March 2022.
12 See https://www.perc.org/2019/07/18/the-role-of-hunting-in-conserving-african-wildlife/#_ftnref17, accessed 12 March 2022.

that much of the research that purports to demonstrate community benefits fails to do so in a number of respects.

Moreover, it appears difficult to justify a potentially ecologically destructive activity on the grounds that communities benefit from protein distribution and income (which are not equivalent) that accrues to trackers and scouts during hunting seasons. Even pro-hunting institutions such as the International Council for Game and Wildlife Conservation find that hunting companies, on average, contribute approximately only three percent of revenue to communities living in hunting areas (Wiggins, 2015), a figure repeated in a separate study by Murray (2017).

Despite the extensive misgivings in the literature pertaining to the quality of efforts to quantify community benefits from trophy hunting, according to the Property and Environment Research Center (PERC), the trophy hunting industry can provide the incentives and revenue necessary to make conservation efforts more resilient while preserving ecosystem health to make those changes sustainable on a long-term basis.[13] The SCI further claims that Southwick's estimates of economic benefits implicitly support their conservation equation, which hypothesises that hunting equals conservation because it generates economic activity that can help pay for conservation. Yet the report only claims a US$426 million economic contribution, without specifying how much of that amount was inflated. Murray (2017) disputes this estimate, asserting that the benefits of trophy hunting have been greatly exaggerated; a more realistic estimate in his *Economists at Large* report is less than US$132 million per year, as indicated earlier in this report. Murray similarly shows that there is no evidence that trophy hunting supports 53,000 jobs, as claimed by Southwick (2015), but the likelihood is that it contributes between 7,500 and 15,500 jobs. Regarding the economic contribution of hunting towards conversation, even Southwick's (2015) assessment is that only between 6% and 9% of economic benefits are potentially directed towards conservation.

In Africa, the main conservation benefit of trophy hunting – according to its proponents – is the creation of economic incentives to conserve wildlife habitats and wildlife populations. As a result of the potential revenue generated by trophy hunting, wildlife and habitat become valuable assets to individuals and communities, making hunting competitive with other land uses. Additional benefits purportedly include the creation of rural jobs and generating revenue for conservation agencies, which in turn decreases their dependence on foreign aid, philanthropy, and appropriations from central authorities. Moreover, proponents of trophy hunting as a potential conservation tool argue that hunting presence (on land that would otherwise convert to ecologically destructive agriculture) not only conserves the land but also provides anti-poaching presence. In the South African case, this argument is relatively obsolete because most hunting occurs on private land in which anti-poaching funding and presence is relatively high. However, as a general argument in favour of trophy hunting in open systems, it fails when one considers the Selous problem referenced in the literature review (Alden & Harvey, 2021; Baldus, 2009).

The major problem with this set of arguments is that the supporting research and empirical base is extremely thin. There exists not a single study (to our knowledge) in South Africa that specifically connects the trophy hunting of elephant, rhino, leopard, lion and giraffe to community benefits and the associated conservation of land that would purportedly otherwise be converted to ecologically destructive uses. The recent quota setting, for instance – aside from its problematic release mentioned in part one – offers neither a public rationale that connects the stated numbers with corresponding conservation benefits nor a scientific argument for how the figures were derived. One would expect, at minimum, that the department would provide an ecological report detailing the exact population dynamics for each species in question and how, based on net growth rates, a certain number (a 'maximum sustainable yield') could be hunted (a 'total allowable offtake') for trophies without jeopardising population health. For a department that is committed to a neoliberal understanding of 'sustainable use', that is a minimal scientific requirement to justify extraction. But this has not been presented to the public, if indeed it exists.

In other words, there is much assertion in the public discourse that is not substantiated by credible research.

Moreover, South Africa does not have a dedicated community-based natural resource management programme the likes of which are practiced in neighbouring countries. Even there, those programmes are seriously controversial.

13 See https://www.perc.org/2019/07/18/the-role-of-hunting-in-conserving-african-wildlife/#_ftnref17, accessed 12 March 2022.

Campfire in Zimbabwe appeared to provide some benefit for a time but appears to have produced unintended negative effects more lately (Mkono, 2019). Community-Based Natural Resource Management programmes in countries such as Namibia (Koot, 2018; Koot et al., 2020) and Botswana (Chevallier & Harvey, 2016b, 2016a) lack the governance required to benefit from any form of economic activity. Given the lack of research pertaining to community benefits derived from trophy hunting in South Africa, the policy idea that trophy hunting of lions, leopards, rhinos, elephants and giraffe benefit communities appears to lack basis in fact.

4. WHAT IS THIS MONEY USED FOR?

What do the people or entities do with this money?

A. If money earned is claimed to benefit conservation, how are the benefits measured?

It is not currently clear how the benefits of the estimated earnings to property owners are distributed or allocated, especially with respect to community benefits and conservation. The only figures on offer are that between 6% and 9% are allocated towards conservation (Murray, 2017), and that roughly 3% of total revenue trickles down to local communities where they are present or affected. In South Africa specifically, the most generous estimates suggest that roughly 17,000 job opportunities are attributable to trophy hunting. As indicated earlier, these are unimpressive numbers as a proportion of overall tourism benefits, which trophy hunting might harm directly.

B. Is trophy hunting the driver for conservation in many rural areas where photo safari operations or agriculture do not offer economic opportunity?

In our view, while trophy hunting on private land is typically held up as the primary reason behind South Africa's 'conservation success story', it is difficult to square this assertion with the evidence presented thus far. Moreover, from a number of responses to a controversial letter penned to the journal *Science* in 2019 (Dickman et al., 2019), the assertion that trophy hunting is the only conservation option in areas that are geographically unamenable to photographic tourism, does not bear up under scrutiny (Batavia, Bruskotter, et al., 2019; Bauer et al., 2019; Nowak et al., 2019). To the contrary, the continued presence of trophy hunting likely crowds out conservations about alternative land uses due to the vested interests of the incumbent landowners. Moreover, there is no counter-factual position – few alternative options have been tried in South Africa despite the relatively strong evidence that non-consumptive tourism is both landscape-preserving and labour-absorptive (Driver et al., 2019). The argument that trophy hunting is the only conservation alternative in non-photographic areas creates a false dichotomy in which alternatives cannot be tried because of a pre-commitment to the idea that they will not be successful at the appropriate scale.

In South Africa, the argument for trophy hunting as the only option for conservation in landscapes aesthetically unamenable to photographic tourism appears to be unfounded, as many privately owned trophy hunting ranches are located in areas that are aesthetically pleasing and therefore potentially amenable to non-consumptive tourism. The APNR is a case in point, where luxury tourist lodges exist in the very same concessions that offer trophy hunting. In some places such as the Central Conservation areas of Botswana, or the southern parts of the Selous Game Reserve (the northern part has been recently declared the Julius Nyerere National Park) in Tanzania, an argument may be made that only hunters are willing to endure thick mopane scrub or the tsetse-fly landscape respectively. However, the answer here – from an ecological economics perspective – appears to be cross-subsidisation of photographically 'weaker' areas (by 'stronger' ones) for the sake of maintaining connected landscapes from which all ecotourism operators benefit in the long run (especially in open, unfenced landscapes such as those present in Botswana and Namibia). The importance of this argument cannot be overstated, given the highly fragmented nature of South Africa's private hunting ranches. This fragmentation is potentially damaging to conservation and while demonstrating high game numbers, it may conceal ecological destruction.

C. Is trophy hunting necessary because it keeps the land conserved for hunting and animals, and national parks are not enough to sustain populations?

It is our considered view that national parks, if well managed, can provide greater ecological and economic benefits than trophy hunting. Moreover, land currently allocated towards trophy hunting does not have to become a national park per se to ensure that conservation benefits are attained. There is nothing to prevent private landowners from connecting

their properties, where geographically appropriate, based on revenue-sharing non-consumptive tourism arrangements. Many smaller South African reserves, for instance, are constrained against being able to host free-roaming elephant populations. While immunocontraception has proved to be a remarkable non-lethal intervention to prevent herd sizes from becoming too large for a landscape to sustain (Delsink et al., 2013), a more ideal scenario would be to create migratory corridors that support free movement and associated population growth, where appropriate (Bond et al., 2017).

Optimal ecological benefit is created through allowing elephant populations to grow naturally, as they are a keystone species and reach a threshold density from which they then disperse, and population growth rates respond naturally to the available habitat (provided it is large enough) (Bond et al., 2017; Henley & Cook, 2019). As a keystone species (Sandom et al., 2020), other species flourish in the wake of elephant population growth (Bunney et al., 2017). Larger, connected wildlife spaces, also create the opportunity for surrounding buffer zones on which conservation agriculture can thrive. This organic produce can supply high-end tourism lodges, at which local community members can also be employed. Integration of local communities into a sustainable ecotourism supply chain appears to be the ideal policy approach to conservation in South Africa and beyond. Indeed, there is a strong argument to be made for funding research that pilots such a project and reports its benefits and challenges. At present, the ascendancy of the trophy hunting model over non-consumptive tourism maintains and perpetuates the very habitat fragmentation and persecution of apex predators that is antithetical to conservation.

Kenya is typically cited by opposing sides in this debate as the exact reason for why countries should not abandon trophy hunting (if one is in favour of trophy hunting) or exactly why one should (if one is opposed to trophy hunting). In our view, Kenya's decision to abandon trophy hunting could have borne more conservation and economic success than it has thus far. This does not, however, constitute an argument for returning to trophy hunting. Communities surveyed in Kenya, for one, are opposed to the notion of returning to a colonial relic that signifies consumptive extractivism. And the debate over trophy hunting crowds out necessary policy conversations about land use decisions and development priorities. It seems clear that alternatives to trophy hunting could be employed to alleviate some of the biodiversity losses attributable to infrastructure and/or human development or expanding cattle populations causing overgrazing in Kenya (Bunney et al., 2017; Ogutu et al., 2016). The kind of model described, above, for instance, might provide a useful re-wilding template for some parts of the Kenyan landscape that have deteriorated.

Academics and policymakers should not move from the assertion that something is not working ideally to concluding that trophy hunting is the answer. If non-consumptive tourism could restore devastated conservation areas in Chad – through an African Parks model – then it stands to reason that ecotourism can succeed in highly unlikely areas with the correct economic model with political will at the highest level (Chapron & López-Bao, 2019).

5. TROPHY HUNTING AND LOCAL COMMUNITIES

A) Are South African trophy hunting operators (from the professional hunters to the taxidermists, the outfitters to the reserves, ranches and captive-breeding operations) actually uplifting and empowering communities as is claimed?

B) Is this at a community level or at a household income level?

C) What is the level at a household income level?

D) Who in local communities is making money and how much?

E) Is trophy hunting effective at alleviating poverty?

F) Who are the true beneficiaries?

Defenders of trophy hunting often claim that the practice contributes to the upliftment and empowering of local communities, particularly in rural areas. Yet, the evidence provided in support of this claim is tenuous, and heavily contested, with few academic studies on this subject. Saayman et al. (2018) contains the most recent estimates regarding the contribution of trophy hunting to the economy of South Africa. The study sampled 251 hunters using survey data and posited that spending by hunters generated income of $341.346 million (2012 prices) for

South African households, of which just under 9% accrued to low-income households. Notwithstanding the limitations of this study detailed above and in the literature review - partly a consequence of its small sample size – this estimate falls on the higher end of available estimates. A 2013 report by Economists at Large suggests that only 3% of revenues generated by trophy hunting is of direct benefit to local communities – although the sample of countries which this figure encompasses is more than just South Africa. Despite the lack of fully costed estimates on the specific monetary amount which trophy hunting contributes to the upliftment of local communities in South Africa, there is consensus that this amount is far less than the amount which goes to government agencies, major firms, and game reserves themselves.

Household-level estimates for the monetary amounts which are accrued in South Africa as a direct result of trophy hunting are also rare. The most comprehensive recent study on the subject is the 2018 Saayman et al. article, which estimates that US$30.551 million (2012 prices) is earned by low-income households, and US$138.97 million is accrued by middle-income households. This is out of a total of US$341.346 million, indicating that (assuming these costing estimates are accurate), only 49.66% of this amount accrues to households, with most of that going to middle income households.

Among low-income households, the main beneficiaries work in the Agriculture (37.6%), Manufacturing (14.5%) and Transport and Communication (13.45%) industries. For middle-income households, it is the same three industries which dominate, with Agriculture accounting for 33.88%, Manufacturing accounting for 14.74%, and Transport and Communication accounting for 14.57%. Industries where low-income and middle-income households benefit least are Electricity and Water, and Construction.

Due to the lack of adequate studies, it is hard to gauge whether the benefits of trophy hunting extend to long-term benefits such as skills upliftment or year-round employment. According to the Saayman et al. study, the industry is responsible for 17,685 jobs in the country, nearly half of which are provided for in the agriculture industry. However, due to the methodological problems present in the study, this figure should not be treated in exact terms, but rather as falling within a band of estimates regarding the total number of people employed in the industry. Another estimate provided by Southwick Associates, mentioned above, estimated that between 2012 and 2014, a combination of direct spending and multiplier spending supported between 9,843 and 15,647 jobs in South Africa. According to Statistics South Africa, 711,746 people worked in the tourism sector in South Africa in 2015. If we take the estimates provided by the Saayman and Southwick studies, then this suggests that between 1.4% and 2.5% of the jobs in the tourism sector have some link to the trophy hunting industry.

Although there is a severe dearth of fully costed information about the specific impact which trophy hunting has on local communities in South Africa, what can be claimed with confidence is that most of the economic benefits which come from trophy hunting are not concentrated among low-income households which are living in rural areas. Even the Saayman et al. study, which is largely defensive of the economic benefits of trophy hunting, indicates that the main beneficiaries of the practice are middle-income households and ranches themselves, with the benefits not always reaching the local communities themselves who only accrue an estimated 9% of the total income from trophy hunting. This 9% figure is itself on the higher end of estimates of how much of the income from trophy hunting tends to go to local communities. Due to the lack of thorough economic analysis which considers this topic, it is also difficult to compare how effective trophy hunting is compared to alternatives when considering the economic benefits thereof.

6. NON-LETHAL ECONOMIC ALTERNATIVES TO TROPHY HUNTING

Are there existing non-lethal economic alternatives to trophy that address development and poverty alleviation in a better way than trophy hunting (including non-wildlife related and non-tourism wildlife alternative such as biodiversity or carbon credits or similar revenue streams)?

What are the opportunity costs of trophy hunting?

Place these estimates in the economic context of existing alternatives to trophy hunting in South Africa

The role that trophy hunting may play in conservation at present is scientifically and ethically questionable, hence

the need to identify alternatives based on consultation with all stakeholders and especially affected local communities. Attempts to reform hunting governance only delay the process of identifying feasible alternatives and continue to perpetuate the notion – against the evidence – that trophy hunting is compatible with either good governance or ecological sustainability. It is also fundamentally unsustainable and inefficient to allocate governance reform effort towards an industry that is evidently in decline (Chardonnet, 2019).

Opportunity costs – the literal value of the opportunities foregone when option *x* is chosen over option *y* – are typically overlooked in the trophy hunting debate. Part of the difficulty is that they are extremely challenging to measure. If, as has happened recently, a prime male Kruger National Park lion is hunted as a trophy in one of the APNR concessions, and it damages South Africa's conservation reputation, on which its tourism brand value is largely built, then it is difficult to quantify the value of that damage. Delicate survey work would have to be undertaken to ascertain how many people that might otherwise have visited South Africa for non-consumptive wildlife tourism will now not do so. The other available potential method is to determine how much value tourists attribute to being able to see iconic species in the wild and measure that value against the probability that either those animals will be made extinct through trophy hunting or that tourists will choose to see the animals elsewhere (in places like Kenya that do not have trophy hunting) (van Tonder et al., 2013). If the value of the latter outweighs the direct revenue from hunting, then policymakers should refrain from endorsing trophy hunting. The studies evaluating opportunity costs of this nature in South Africa have simply not been done. Until such time as they have been, it is advisable – in light of the precautionary principle – to refrain from trophy hunting and pursue non-lethal, sustainable alternatives.

This is just one element of the opportunity cost, however, associated with trophy hunting. The other pertains to the economic value derived from the ecological benefits that certain animals provide to their ecosystems. It is intuitively uncouth to reduce a wild animal to an economic number, but this is typically what the trophy hunting fraternity has resorted to in support of its trade. In doing so, however, this approach should at least make comparable judgments. An elephant (Chapron & López-Bao, 2019), for instance, like a whale (Chami et al., 2019) has carbon sequestration value. Contrary to the idea that elephants are landscape-destructive, for instance, recent research clearly demonstrates that heterogeneous, uneven landscape impact is ecologically healthy for large, open ecosystems such as the Kruger National Park (Henley & Cook, 2019). Similarly, African forest elephants have been shown to have significant carbon sequestration value because of the way in which they thin out trees to allow the growth of the most carbon-absorbing trees (Berzaghi et al., 2019). Furthermore, a recent study by Kristensen et al. (2022) demonstrates that ecosystems with large herbivores such as elephants may store a larger fraction of total ecosystem carbon in soil pools that are less vulnerable to disturbances than living plant biomass. Work is currently being undertaken to establish robust methodologies that can attribute appropriate value.[14]

We can, with caution, attribute a carbon sequestration value to an individual elephant over its lifetime. For African forest elephants alone, assuming that there are 55,000 remaining (a mid-point between the scientific estimate and informed guesses), and their extirpation would represent a US$43 billion loss at a carbon price of US$15/ton (Berzaghi et al., 2019; Poulsen et al., 2018), each elephant is valued at roughly US$781,818. At a carbon price of US$50/ton, only half of the amount required to meet the goals of the 2015 Paris Agreement, this amount increases to US$2,606,060 per elephant. Taking the upper bound guess figure of 103,000 forest elephants, the individual valuation is reduced to US$417,475 per elephant at a carbon price of US$15/ton. At US$50/ton, that value increases to US$1,391,583.

If savanna elephants are attributed even half of the carbon sequestration value of forest elephants, say US$208,737 (at a carbon price of US$15/ton), then the 'global stock' of remaining savanna elephants (estimated at 415,000) (Berzaghi et al., 2019; Poulsen et al., 2018) should be minimally valued at US$86,626,213,592 (US$86.6 billion). This is extremely conservative. The combined value of remaining forest and savanna elephants is a minimum of US$129.6 billion in carbon sequestration terms alone, given critical ecological contribution; this at a minimal carbon price of US$15/ton. At US$50/ton, the value figure increases to US$430 billion.

14 Personal correspondence with Berzaghi.

If each elephant in South Africa was attributed a conservative carbon sequestration value of US$400,000, then justifying an elephant trophy hunt at a mere $46,000 would appear economically absurd.

As mentioned above, a number of letters recently appeared in *Science* in response to an initial letter (Dickman et al., 2019) cautioning that trophy hunting bans might imperil biodiversity. Bauer, et al (2019, p. 433) responded that "habitat in hunting zones is often not effectively protected, and the collapse of trophy hunting observed in certain areas is not due to trade bans but to a failing balance of costs and benefits. Trophy hunting is neither the main threat nor the main opportunity for wildlife conservation, and we encourage a broader debate". Indeed, if it is the case that more than US$1 billion a year is required to secure Africa's protected areas with lions alone (2019, p. 433), and hunting's revenue contribution to conservation is declining rapidly (along with the size of trophy animals or secondary sexual characteristics such as tusks) (Chardonnet, 2019), then it clearly is the case that new funding models are required to preserve habitat for migratory species, and all the other species that apex predators and megaherbivores support (Ripple et al., 2014; Ripple, Chapron, et al., 2016). Lindsey et al (2018) note that protected areas with lions require US$1.2 to US$2.4 billion or US$1,000 to US$2,000/km^2 (median) annually.

In an effort to encourage a broader debate, Nowak et al (2019, p. 434) suggested that Dickman et al. were actually describing how the loss of conservation funding may impart negative effects on species' survival probability "without specifying any unique benefits of trophy hunting". Defending business-as-usual models will fail to deliver the "alternative conservation activities that could sustain formerly trophy-hunted species and areas" (ibid.). After summarising the arguments against trophy hunting (largely that it generates negative ecological externalities (2019, p. 434) (Loveridge et al., 2016; MILNER et al., 2007; S. A. J. Selier et al., 2014; Shannon et al., 2013) without delivering as promised economically (Nordbø et al., 2018; Segage, 2015), they argue for a range of alternative funding sources that are ultimately more sustainable than trophy hunting.

Chami et al (2019) points out that merely placing a more appropriate dollar value on an animal (a whale in the case of their study) does not automatically lead to the allocation of more capital to protect them and their ecosystems. Regarding whale protection, for instance, they note that a financial facility must be established and funded. They estimated that "if whales were allowed to return to their pre-whaling numbers, capturing 1.7 billion tons of CO_2 annually – it would be worth about $13 a person a year to subsidise these whales' CO_2 sequestration efforts" (2019, p. 37).

Orr, among others, has suggested a global biodiversity tax as a necessary means of funding conservation (Orr, 2016) if trophy hunting is no longer a viable option (and clearly it is not). Nowak et al. (2019) point out that "environmental investments could connect would-be micro-investors more directly to wildlife-wealthy communities. Financial strategies such as decentralised markets made possible by blockchain technology could use carbon and biodiversity credits for conserving habitats" (Nowak et al., 2019, p. 434). Chardonnet (2019) notes that an adequate budget for managing protected areas is estimated at between US$7 and US$8 per hectare per year in Africa. There is relative consensus across the conservation spectrum (regardless of one's position on trophy hunting) that ensuring community livelihoods is critical to conservation (Chevallier & Harvey, 2016a). Those bearing the costs of living with or near wildlife, or who would otherwise gain from trophy hunting in some way, must be adequately compensated to refrain from unsustainable consumption and positively incentivised to protect landscapes that are currently fragmented and being destroyed.

"For several years, with the great decline in the big game hunting sector almost everywhere in Africa, the possibility of joining up certain hunting areas with protected areas – in line with the Aichi targets – there has been a major opportunity to ensure that 17% of national territories are classified as real protected areas. The challenge will be to finance them." (Chardonnet, 2019).

Distributing cash directly to citizens living inside or alongside protected areas will be critical, along with building political commitment to conservation that is globally funded. Paying a nominal tax on cash received may help to incentivise governments to support globally funded conservation. Ultimately, conservation and development need to be integrally connected to protect elephants and other creatures that are our global public heritage (Chardonnet, 2019, p. 3).

If elephants alone were to be given the space required for their populations to grow to beyond 1 million, it would represent a carbon sequestration value of a total potential of US$834,145,518,000 (US$834 billion), aside from the

other vital ecological and economic benefits to neighbouring communities derived from protecting wild habitat. Sufficient space is critical, as optimal ecological functionality occurs when elephants are allowed to reach a threshold density from which they then disperse, and population growth rates respond to natural conditions (Chardonnet, 2019). In reserves where migratory corridors are cut off by ill-considered fence imposition, elephants are unlikely to contribute positively to ecological functionality unless immunocontraception methods are being applied (Henley & Cook, 2019).

Expanding on Nowak et al.'s ideas, Mkono et al. indicate that carbon and biodiversity credit schemes do work and can be scaled up (Mkono et al., 2020). They provide the example of GainForest, an app that aims to help maintain and restore forests. The initiative receives funding from the crypto currency community to distribute cash to community members if they maintain their patch of land for an agreed duration. In line with Chami et al.'s suggestion of reorienting the UN programme on Reducing Emissions from Deforestation and Forest Degradation (REDD+), which encourages developing economies to lower their carbon emissions through a variety of habitat management schemes, Mkono et al. (2020) provide a similar endorsement. The Kariba REDD+ project in Zimbabwe, for instance, has protected 785,000 hectares from deforestation and land degradation, preventing more than 18 million tonnes of carbon dioxide emissions. There is no reason why similar schemes in South Africa could not be employed to incentivise conservation through alternative revenues to trophy hunting.

Carbon Tanzania, another example, pursues a community-led approach that incentivises forest preservation and Hadzabe culture simultaneously. In other words, the community owns the decision-making processes pertaining to preservation and revenue distribution. The project operates in an area in northern Tanzania inhabited by the Hadzabe community, one of the last remaining hunter-gatherer communities in the country, and issues carbon credits which can be bought by companies, organisations and individuals to offset their emissions. The project measures the carbon sequestration capacity of the relevant forests and converts them to carbon certificates, which are then traded on global carbon markets (2020). With all cash-to-citizen transfer schemes, the question of appropriate institutional scaffolding must also be answered. Secure land ownership is critical to the success of the Carbon Tanzania project, alongside a binding land use plan that protects the area from external pressure. "Payments for ecosystem services generate benefits for the local forest community and support community development" (Fassbender, 2016). Fassbender (2016) concludes that harvesting carbon from an intact forest ecosystem can generate the means to invest in community development that is typically otherwise produced by clearing forests to make way for ecologically destructive agricultural practices.

In response to Nowak et al., Dickman and her co-authors argue that the sustainable alternatives offered in place of trophy hunting are unlikely to imminently replace trophy hunting anywhere beyond a minority of atypical cases. "In particular, the idea that trophy hunting – which can generate hundreds of thousands of dollars from a single hunter, and conserves extensive habitat – can be replaced with smaller-scale, lower-revenue approaches such as survival training and agritourism defies belief."[15] Dickman et al. also contend that protecting carbon stores "does not necessarily incentivise the conservation of viable populations of species previously given value by trophy hunting".[16] The approach recommended in this report is that attributing a truer ecological-economic value to an animal such as an elephant may help to turn that argument on its head.

The policy question is how to scale up viable projects such as those offered by Carbon Tanzania and the Kariba REDD+ project, and adequately finance them in a way that reflects a truer ecological-economic value of the species in question.

In conclusion, it is painfully clear that the necessary cost-benefit analyses required to justify the continued trophy hunting of lion, leopard, giraffe, rhino and elephant have not been conducted. In light of the alternatives available for funding conservation, it appears that South Africa would be fully justified in deciding to abandon trophy hunting these iconic species. The opportunity costs are potentially high, and the direct value is limited at best.

15 Dickman, A. Response is available here: https://science.sciencemag.org/content/366/6464/434/tab-e-letters, accessed 17 April 2020.
16 Ibid.

Conclusion

The questions answered above provide a thorough indication that trophy hunting is of limited conservation value from an economic perspective. It is also questionable whether it produces significant economic benefit on its own merits. The fact that it provides miniscule economic benefits, especially to poor households, and may directly undermine conservation, appears to be a strong argument in favour of abandoning trophy hunting, especially of iconic species.

The High-Level Panel Report and the subsequent Draft Policy Position produced by the South African government elevate the importance of trophy hunting as a conservation tool without marshalling evidence in its favour. Too much is asserted without empirical grounding, especially for a practice that produces ecological devastation because it targets prime males (they make the best trophies). Even the economic arguments used to support trophy hunting do not consider its opportunity costs (like the one mentioned in the previous sentence).

Aside from the obvious lack of economic or conservation arguments in favour of trophy hunting in South Africa, strong evidence of misgovernance is available but not mentioned in the HLP report or Draft Policy Position. Even the most ardent academic supporters of trophy hunting recognise that the practice is destined for failure unless it is well governed. The fact that male elephants and lions, for instance, are sometimes shot in their prime (or in front of tourists), or that contracts are sometimes suddenly allocated to a distant chief, suggest that governance constraints are absent.

Moreover, the process by which trophy hunting quotas are allocated in the APNR remains entirely unclear and is not available to public scrutiny, even though the animals being shot are clearly Kruger Park animals (public heritage).

For these reasons, and the ones provided within the body of the report, the South African government would be well advised to abandon its support for the trophy hunting of elephant, rhino, leopard, lion and giraffe.

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For further information contact Good Governance Africa:
Tel: 011 268 0479 **Email:** info@gga.org **Web:** www.gga.org

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