

Potential of trophy hunting to create incentives for wildlife conservation in Africa where alternative wildlife-based land uses may not be viable

P. A. Lindsey¹, R. Alexander², L. G. Frank³, A. Mathieson¹ & S. S. Romañach¹

¹ Mpala Research Centre, Nanyuki, Kenya

² Department of Environmental Studies, Sweet Briar College, Sweet Briar, VA, USA

³ Museum of Vertebrate Zoology, Berkeley, CA, USA

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Correspondence

Peter A. Lindsey. Current address:
Savé Valley Conservancy, PO Box 47,
Birchenough Bridge, Zimbabwe.
Email: palindsey@gmail.com

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Abstract

There is a lack of consensus among conservationists as to whether trophy hunting represents a legitimate conservation tool in Africa. Hunting advocates stress that trophy hunting can create incentives for conservation where ecotourism is not possible. We assessed the hunting preferences of hunting clients who have hunted or plan to hunt in Africa ($n = 150$), and the perception among African hunting operators ($n = 127$) of client preferences at two US hunting conventions to determine whether this assertion is justified. Clients are most interested in hunting in well-known East and southern African hunting destinations, but some trophy species attract hunters to remote and unstable countries that might not otherwise derive revenues from hunting. Clients are willing to hunt in areas lacking high densities of wildlife or attractive scenery, and where people and livestock occur, stressing the potential for trophy hunting to generate revenues where ecotourism may not be viable. Hunting clients are more averse to hunting under conditions whereby conservation objectives are compromised than operators realize, suggesting that client preferences could potentially drive positive change in the hunting industry, to the benefit of conservation. However, the preferences and attitudes of some clients likely form the basis of some of the problems currently associated with the hunting industry in Africa, stressing the need for an effective regulatory framework.

Introduction

There is an increasing realization that Africa's parks network does not adequately conserve biodiversity, and that there is a need to conserve wildlife outside of protected areas (Fjeldsa *et al.*, 2004). For conservation outside of parks to be successful, sufficient revenues must be generated from wildlife to offset opportunity costs associated with protecting wildlife and habitats. Ecotourism represents one means of generating revenues from wildlife, and has proven successful in creating income from and for several major national parks and privately owned wildlife areas in Africa, and to a lesser extent communally owned wildlife areas (Barnes, 2001; Kiss, 2004; Thirgood *et al.*, 2006). However, there are not enough tourists to generate revenues for all of Africa's protected areas or for most of the wildlife habitat that occurs outside of parks (e.g. in Zambia, Lewis & Alpert, 1997; Central Africa, Wilkie & Carpenter, 1999a; and even Kenya, Grunblatt *et al.*, 1995). Consumptive wildlife utilization represents an additional means of generating revenues from wildlife, and can be conducted as a complement or alternative to ecotourism.

Trophy hunting is the most profitable form of consumptive wildlife utilization, and represents a large and growing industry in several parts of Africa (Child, 2000; P. A. Lindsey, unpubl. data). For example, trophy hunting generates US\$65.6–137 million per year in South Africa (van der Merwe, 2002; Damm, 2005), US\$27.6–36.1 million per year in Tanzania (Baldus & Cauldwell, 2005), US\$18.5 million per year in Zimbabwe (Booth, 2002) and US\$12.6 million per year in Botswana (ULG Northumbrian, 2001). These revenues provide economic justification for wildlife as a land use over vast areas. For example, trophy hunting is conducted on ~250 000 km² in Tanzania (Baldus & Cauldwell, 2005), ~82 250 km² in Mozambique (Hatton, Couto & Oglethorpe, 2001; C. Begg, pers. comm.) and ~65 000 km² in Zimbabwe (Booth, 2002), most of which are additional to protected area networks. Consequently, trophy hunting is of major importance to conservation in parts of southern, East and Central Africa.

Despite the scale of the industry, little has been written in the scientific literature on the role of hunting in African conservation, the impact of trophy hunting on wildlife populations or the importance of hunting revenues in

creating incentives for conservation. This lack of information renders some governments, conservationists and foreign NGOs uncertain about the conservation value of the industry (Wilkie & Carpenter, 1999a). Opinion among conservationists concerning trophy hunting has become polarized, ranging from absolute opposition by protectionists to those who see trophy hunting as a practical means of creating incentives for conservation (Hutton & Leader-Williams, 2003). There is also increasing resistance to the idea of killing animals for sport among urban residents of the developed world, as highlighted by the recent ban on fox *Vulpes vulpes* hunting in the UK. Anti-hunting sentiment is enhanced by increasing media attention to animal welfare issues such as the hunting of foxes, deer *Cervidae* spp. and leopards *Panthera pardus* with dogs, and ethical issues such as 'canned' killing of lions *Panthera leo* (releasing captive-reared animals in small enclosures to be shot).

In addition to ethical and animal welfare issues, there are a number of problems that limit the conservation role of trophy hunting in Africa (Baker, 1997). These include social problems such as the inequitable distribution of hunting revenues, inadequate involvement of communities, corruption (Mayaka *et al.*, 2004; Lewis & Jackson, 2005) and ecological problems such as setting quotas in the absence of adequate population data and overshooting of quotas (Baker, 1997; Caro *et al.*, 1998).

The emphasis placed on trophies by the safari industry may also limit the conservation role of trophy hunting. For example, the Congo Basin lacks many of the species that attract tourists and hunters to southern and East Africa (e.g. lions, and rhinos *Diceros bicornis*, *Ceratotherium simum*) and thus may have lower potential to derive income from trophy hunting (Wilkie & Carpenter, 1999a,b). In Zimbabwe, problem elephants *Loxodonta africana* are offered at a discount because operators believe that securing a good trophy is more important to clients than assisting communities in problem animal control (Treves & Naughton-Treves, 2005). (Problem animals are individuals causing crop or livestock losses, or threatening human life; Packer, 2003.) In South African game ranching areas, the high value of wildlife as trophies has encouraged the division of large areas into small blocks surrounded by 'game'-proof fencing, where 'non-hunttable' predators (e.g. cheetahs *Acinonyx jubatus* and wild dogs *Lycaon pictus*) are persecuted because they prey on trophy species (Marker, Mills & Macdonald, 2003; Lindsey, du Toit & Mills, 2005). Under these conditions, exotic species are frequently introduced to increase the diversity of trophies, and in some cases ranchers manipulate genetics to offer prized aberrant varieties such as white or black springbok *Antidorcas marsupialis* (Hamman, Vrahimis & Blom, 2003). Management may be so intense that trophy animals requested by clients are purchased and released on ranches immediately before the hunt ('put-and-take' hunting).

Despite these problems, hunters and many conservationists remain convinced that trophy hunting plays a major role in African conservation (see online journal *African Indaba* www.africanindaba.co.za for examples). P. A. Lindsey *et al.*

(unpubl. data) found that 100% of African hunting operators and 99% of hunting clients believe that trophy hunting plays a positive role in wildlife conservation. Positive aspects of trophy hunting as a conservation tool include a low off-take rate and a focus on males (typically 2% of male populations), both of which do not generally jeopardize wildlife populations, and also mean that trophy hunting can play a role in endangered species conservation (Leader-Williams *et al.*, 2005). Trophy hunters pay higher fees per client than conventional tourists (Baker, 1997; Lewis & Alpert, 1997); therefore, revenues can be generated from lower volumes of people, resulting in potentially lower environmental impact (Gössling, 2000; Mayaka *et al.*, 2004). Advocates also point out that trophy hunting generates revenues for conservation in areas that may not be suitable for tourism, such as those lacking attractive scenery or high wildlife densities (Leader-Williams & Hutton, 2005). Additionally, trophy hunters may also be less easily dissuaded than conventional tourists from visiting countries experiencing political instability (Leader-Williams & Hutton, 2005).

In this study, we measured hunting client preferences and hunting operators' perceptions of client preferences to assess:

1. whether client preferences include values that might benefit conservation or local community development,
2. the potential for less visited countries to benefit from trophy hunting and
3. the potential for trophy hunting to generate revenues in areas with low tourism potential.

Methods

Hunting operators and prospective hunting clients were interviewed by three of the authors (P. L., A. M. and L. F.) at the Dallas Safari Club (DSC) and Houston Safari Club (HSC) conventions in January 2005, using a structured questionnaire (available as online Supplementary Material Appendices S1 and S2). DSC was selected because it is one of the largest hunting conventions in the world, and because of the proximity to HSC, another large convention. DSC and HSC attract hunters from throughout the United States. Most hunting operators in Africa tour US hunting conventions to advertise their services, and by virtue of their sizes, the DSC and HSC conventions are attended by most of the operators making this tour. Most African hunts are booked at US hunting conventions (Lewis & Jackson, 2005), and so we believe that hunters attending DSC and HSC conventions are representative of US hunters visiting Africa.

Clients from the United States form the bulk of visiting hunters in most of southern and East Africa, where most trophy hunting in Africa is conducted. However, European hunters are more numerous in Central and West Africa. Consequently, our results should be considered as applicable only to US market segments of hunting operations in southern and East Africa.

Operators ($n = 127$) and clients ($n = 150$) were interviewed at both conventions, each of which lasted for 3 days. We systematically sampled clients in the aisles between

advertising booths. Potential client respondents were selected randomly, irrespective of appearance or behaviour. As each interviewer became available, s/he queried the first potential respondent to enter their proximity to determine whether they had previously hunted in Africa or whether they intended to hunt in Africa in the next 3 years. The interview was conducted if the potential respondent answered affirmatively. A total of 150 client interviews was conducted.

Potential operator respondents were considered suitable for participation if they were based in Africa or if they took clients to Africa to hunt. There was a total of 149 such operators attending one or both conventions. We attempted to interview all operators and successful interviews were obtained from 126 (85%) of the eligible operators in attendance. The remaining eligible operators either were unavailable (11%) or refused to participate (4%).

The client questionnaire comprised three sections: (A) 'Role of hunting in conservation'; (B) 'Hunting preferences'; and (C) 'Personal details'. Several questions were asked of clients that aimed to assess whether their preferences extended beyond the product of a hunt, and to determine their willingness to hunt under conditions where conservation objectives might be compromised.

Clients were also asked a series of questions with the goal of identifying which countries have potential to generate revenues from trophy hunting, and to identify which species are of key importance in determining the potential to derive income from trophy hunting. For example, clients were asked in which African countries they had previously hunted, and to indicate in which country they would most like to hunt in the future. They were then asked two questions regarding the species they would most like to hunt: an open-ended question in which they were asked to indicate the three species they would most like to hunt, and a closed-ended question in which they were asked to assign a score of 0–5 (where 0 = not interested and 5 = very interested) to each of several species to indicate their interest in hunting it. The combined effect of the two questions was to enable us to assess interest in hunting specific species, including some that are not generally hunted (e.g. wild dogs).

Finally, clients were asked to indicate their willingness to hunt under various scenarios, as a means of assessing the potential for trophy hunting to generate revenues where ecotourism may not be viable. The operator questionnaire was similar, and was designed to assess operators' perceptions regarding clients' preferences.

A limitation to our data is the potential for strategic bias in that clients may have felt a self-imposed pressure to provide socially acceptable answers because they were aware the survey was being conducted by conservationists. Similarly, the potential for hypothetical bias exists in that opinions of a client on a convention floor may differ from their feelings and actions when in the hunting area after having paid large sums of money for a hunt. Although the authors acknowledge the potential, the interviewers note that clients tended to respond to questions quickly and with emotion, suggesting that their answers were genuine.

We tested for differences in data collected from the two conventions, and there were no significant differences for any relevant variable; therefore, the data were combined. χ^2 tests were used to compare responses to questions with binary answers between operators and clients, and between answers made by clients who had and had not previously hunted in Africa (hereafter 'experienced' and 'inexperienced clients') (JMPIN, 2000). Two-tailed Mann–Whitney *U*-tests were used to compare responses to questions with multiple response categories (Statview, 1998). After testing for and confirming normality using the Shapiro–Wilks test (Zar, 1996), Student's *t*-tests (two tailed) were used to compare the minimum size of hunting areas desired by clients with operators' perceptions of clients' desires (Statview, 1998).

Results

Hunter preferences and conservation

Hunter preferences indicated that clients were generally unwilling to hunt under conditions whereby conservation issues were compromised (Fig. 1). Clients were less willing than operators realize to hunt where wild dogs and cheetahs are illegally shot ($\chi^2 = 8.72$, d.f. = 1, $P < 0.01$; $\chi^2 = 10.7$, d.f. = 1, $P < 0.01$), where there is game fencing ($\chi^2 = 4.89$, d.f. = 1, $P = 0.03$), even if this meant lower densities of trophies than in a fenced area, and where legal quotas are exceeded ($\chi^2 = 13.2$, d.f. = 1, $P < 0.01$) (other differences in Fig. 1 were not statistically significant). However, 60% of clients were willing to hunt exotic species, 12.4% were willing to purchase put-and-take hunts (where trophies are purchased and released onto a property immediately before a hunt), and 31.9 and 20.4% were willing to hunt where cheetahs and wild dogs are persecuted, respectively. There were no significant differences in the willingness of experienced and inexperienced clients to hunt under these circumstances.

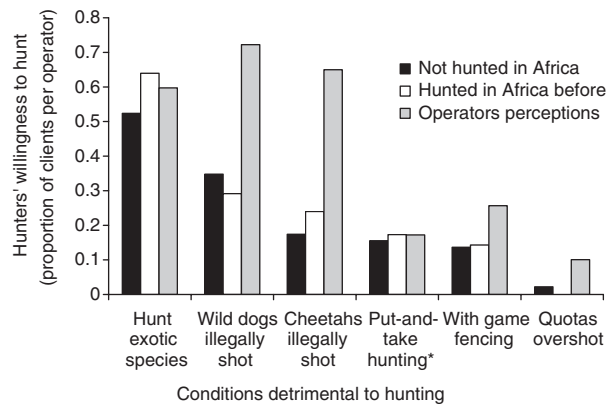


Figure 1 Willingness of clients to hunt under conditions detrimental to conservation, and operators' perceptions of clients' willingness to hunt under these conditions (*where trophy animals are released onto a property immediately before a hunt).

Client interest in hunting in multiple African countries

Country preferences

Sixty-nine per cent of clients interviewed had hunted in Africa during the last 10 years, at an average of 3.65 times each [standard deviation (SD) 3.68]. South Africa was the country that most clients had hunted in, followed by Zimbabwe, Tanzania and Namibia (Fig. 2). When asked to indicate the countries they would most like to hunt in, Tanzania was the most popular first choice, followed by Kenya and Zimbabwe (Fig. 3). Patterns of hunter motivation indicated that clients were most interested in hunting in Kenya (where hunting has been banned since 1977) because of the history of hunting there, and in Tanzania and Zimbabwe because of the presence of the best buffalo trophies in those countries (Table 1). Patterns of hunter experience suggested that South Africa was more popular among inexperienced than experienced clients ($\chi^2 = 13.6$, d.f. = 1, $P < 0.01$), whereas Kenya was more popular among experienced clients ($\chi^2 = 13.2$, d.f. = 1, $P < 0.01$) (Fig. 3). No other differences in the popularity of countries were statis-

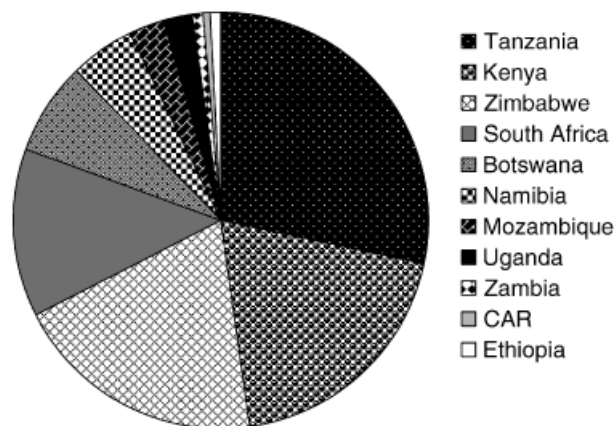


Figure 2 Proportion of clients that have hunted in each country.

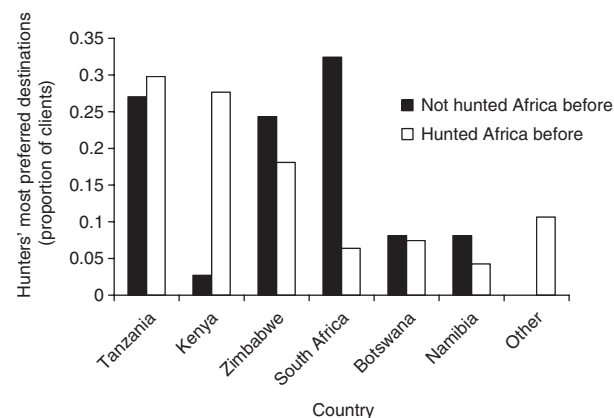


Figure 3 Proportion of clients citing each country as the African destination they would most like to hunt in.

tically significant. Only experienced clients indicated that they would want to hunt in other countries [Central African Republic (CAR), Ethiopia, Mozambique, Sudan or Zambia]. Ninety per cent of clients would be interested in hunting in Kenya if trophy hunting were made legal there. Nearly 72% (71.8%) of clients would be willing to hunt in Zimbabwe at present.

Species preferences

Buffalo was the most popular trophy species, followed by leopard, kudu *Tragelaphus strepsiceros* and lion (Fig. 4). Rare antelopes and those with limited geographic distribution (bongo *Tragelaphus euryceros*, lechwe *Kobus leche*, nyala *Tragelaphus angasi*, Lord Derby eland *Taurotragus derbianus*, mountain nyala *Tragelaphus buxtoni*, lesser kudu *Tragelaphus imberbis* and sitatunga *Tragelaphus spekei*) were also popular. Kudu were more popular among inexperienced than experienced clients ($U_{95,67} = 3376$, $P < 0.01$), whereas rare antelopes were more popular among experienced clients ($U_{65,80} = 2947$, $P = 0.04$). No other differences visible in Fig. 4 were statistically significant. There was some interest among clients in hunting vulnerable and endangered species: 19% (18.7%) of clients were very interested in hunting wild dogs (having denoted scores 4 and 5 on a 0–5 scale), 37% were very interested in hunting cheetahs and 41% were very interested in hunting black rhinos.

Trophy hunting where ecotourism may not be viable

Hunting area preferences

High-quality outfitting (professionalism and ability of the hunting operator) and trophy quality were important to clients when selecting a hunting area, as were several factors not directly related to the acquisition of trophies (Fig. 5a). A guarantee of obtaining trophies during the hunt, and attractive scenery in the hunting area were more important to inexperienced than experienced clients ($U_{90,66} = 3100$, $P < 0.01$; $U_{45,102} = 1661.50$, $P < 0.01$; Fig. 5a).

Operators generally had a fairly accurate impression of the relative importance of various factors to clients when selecting a hunting destination (Fig. 5a). However, the presence of cheetahs for viewing and a wilderness feel to the hunting area were more important to clients (inexperienced and experienced clients combined) than operators realized ($U_{147,120} = 6913$, $P < 0.01$; $U_{150,124} = 7846$, $P = 0.02$). In addition, a large hunting area and the presence of attractive scenery were also more important to clients than operators realized, although the differences were not statistically significant ($U_{150,125} = 8171$, $P = 0.06$; $U_{148,124} = 8006$, $P = 0.07$). Conversely, a guarantee of obtaining the trophy during the hunt was less important to clients ($U_{148,125} = 7343$, $P < 0.01$; Fig. 5a). No other differences visible in Fig. 5a were statistically significant. The minimum hunting area acceptable to (both experienced and inexperienced) hunting clients [$643 \text{ km}^2 \pm \text{standard error (SE)} 346$]

Table 1 Percentage of respondents providing reasons as to why they would most like to hunt in each country (respondents were able to provide more than one reason, so columns need not total 100%)

	Botswana	Kenya	Namibia	South Africa	Tanzania	Zimbabwe
<i>Trophies</i>						
Best trophies	0	17	0	0	6	12
Diversity of trophies	0	0	0	0	6	8
Best buffalo trophies	0	0	0	0	22	23
<i>Hunting</i>						
History of hunting	0	39	0	0	6	0
Old style hunting	0	0	0	0	13	4
No hunting for long time	0	22	0	0	0	0
No fences in hunting areas	0	0	0	0	13	4
<i>Characteristics of country</i>						
Safe/stable country	25	0	43	44	3	0
Beautiful country	25	0	0	0	13	4
Like country/people	13	4	0	22	9	15
Species present in the country	13	13	29	11	9	0
Lots of wildlife in the country	0	22	14	0	19	19
Value for money	0	0	14	6	0	8
Recommended to me	13	4	14	22	0	8

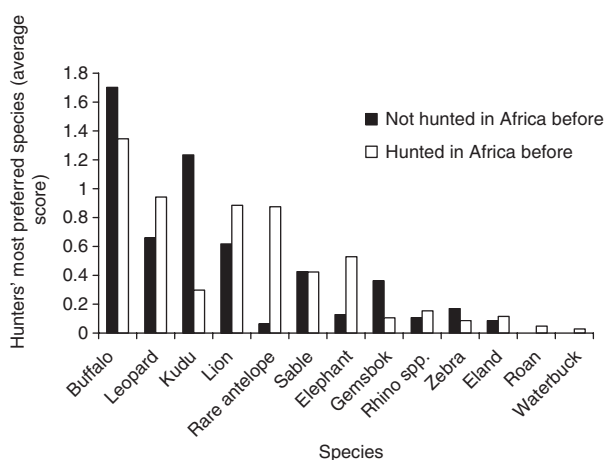


Figure 4 Interest among clients in hunting various species following an open-ended question, where clients were asked to state the three species they are most keen to hunt (for each client, the first species was given 3 points, the second 2 points and the third 1 point).

for plains game (antelope) hunts was 7.8 times larger than operators realized ($82 \text{ km}^2 \pm 11.2$, $t = 4.1$, $\text{d.f.} = 241$, $P < 0.01$). Operators had a more accurate impression of the minimum area for dangerous game hunts ($388 \pm 58 \text{ km}^2$) desired by clients ($361 \text{ km}^2 \pm 59$, $t = -0.3$, $\text{d.f.} = 226$, $P = 0.75$).

Ninety-one per cent of clients indicated that they would be willing to buy a hunt in an area lacking high densities of viewable wildlife, 89% in an area lacking attractive scenery, 88% where local communities live within the hunting area and 71% where livestock are present (Fig. 5b). Clients (inexperienced and experienced clients combined) were more willing to hunt in areas with local communities living in the hunting area ($\chi^2 = 5.4$, $\text{d.f.} = 1$, $P = 0.02$) and where livestock occur in the hunting area ($\chi^2 = 4.1$, $\text{d.f.} = 1$, $P = 0.04$)

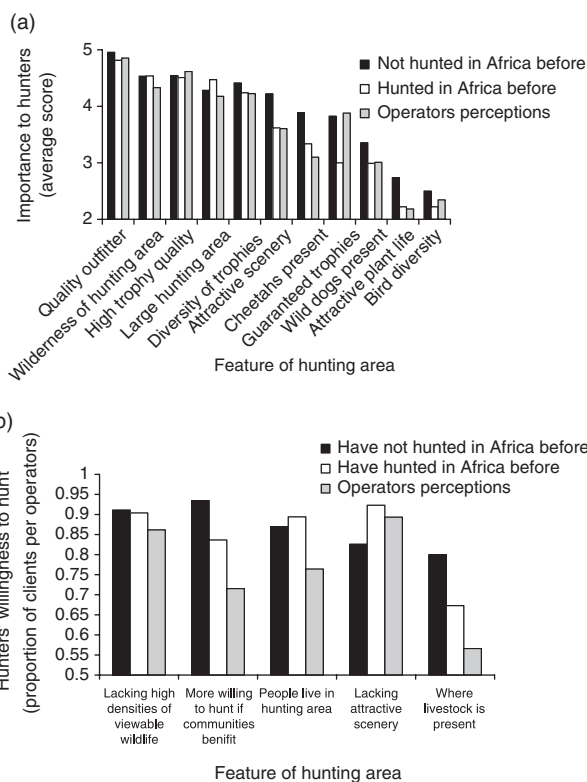


Figure 5 (a) Importance of various factors to clients when selecting a hunting area, and operators' perceptions of the importance of each factor (0=low importance, 5=high importance); (b) willingness of clients to hunt given various hunting area characteristics, and operators' perceptions of clients' willingness to hunt.

than operators realize (Fig. 5b). Eighty-six per cent of clients would prefer to hunt in an area if they knew that a proportion of the proceeds went to impoverished local communities, and clients were more concerned that communities benefit than operators realize ($\chi^2 = 9.4$, d.f. = 1, $P = 0.02$). Other differences evident in Fig. 5b were not statistically significant.

Forty-six per cent of clients would be willing to pay more or the same as typical trophy fees to shoot a problem animal that is a poor trophy, whereas only 16.5% of operators thought that clients would be willing to pay the same or more for such an animal ($\chi^2 = 20.9$, d.f. = 1, $P < 0.01$).

Discussion

Hunter preferences and conservation

Our data suggest that hunting client preferences include values that have the potential to benefit conservation and community development. Contrary to the belief of many hunting operators, most clients are unwilling to hunt under conditions whereby conservation objectives are compromised, such as where quotas are overshot or where put-and-take hunting is practised. Operators overestimated the importance of guarantees of obtaining trophies to clients, and underestimated the importance to clients of local people benefiting from their hunt. These findings suggest that if clients were able to select effectively among hunting operators in terms of issues related to conservation, then client preferences could potentially drive change in the industry to the benefit of conservation. One means of facilitating such market-based change would be to assist clients in the hunting operator selection process through independent accreditation of hunting operators based on their commitment to conservation and community development (Lewis & Alpert, 1997; Baldus & Cauldwell, 2005; Packer, 2005).

The southern African game ranching industry, for example, could benefit (in conservation terms) from market pressure. Clients' desire to hunt in large, unfenced wilderness areas could create incentives for the creation of conservancies where neighbouring landowners remove internal fencing to create a larger area. In conservancies, landowners are more tolerant of predators, and management focuses on the maintenance of intact guilds rather than the species breeding programmes common on fenced ranches (Lindsey *et al.*, 2005).

Client preferences also suggest that trophy hunting could benefit conservation by creating incentives for endangered species conservation. In South Africa, for example, the legalization of white rhino hunting resulted in reintroductions on private land, and a population increase from < 100 to $> 11\,000$ (Leader-Williams *et al.*, 2005). Limited black rhino hunting was recently legalized in Namibia and South Africa, with the hope of stimulating a similar recovery (Leader-Williams *et al.*, 2005). There is also interest among clients in hunting cheetahs (limited hunting permitted in Botswana, Namibia and Zimbabwe; Marker, 1998) and wild dogs (not legally hunted anywhere). Both species are persecuted by

ranchers in southern Africa because of a perception that they kill livestock or game and have no value (Marker *et al.*, 2003; Lindsey *et al.*, 2005). Enabling ranchers to derive income from these species through hunting may thus reverse negative attitudes. However, care would be required to prevent overshooting, capture of wild animals for captive breeding and sale, and 'canned' hunting.

Many clients indicated that they would more likely select a hunting area given the chance just to view cheetahs and wild dogs, suggesting that these species may have further value to ranchers as marketing tools. Likewise, some hunters suggested that other aspects of biodiversity not related to hunting were important to them when selecting a hunting destination, such as a high bird diversity and attractive vegetation. Hunters are often accompanied by paying, non-hunting companions, who require entertaining during their stay. Consequently, trophy hunting has the potential to create incentives for the conservation of biodiversity beyond that required for hunting.

Clients expressed an interest in hunting problem animals, which suggests that trophy hunting could reduce human-wildlife conflict by generating revenues from animals that would have been killed anyway (Conover, 2002). Many clients are willing to pay the same or more for problem animals as for regular trophies of the same species, even if they are poor trophies. Operators presently do not exploit this interest, and problem animal hunts are cheaply priced and rarely advertised (P. A. Lindsey *et al.*, unpubl. data)]. Marketing and pricing problem animal hunts appropriately could potentially offset costs incurred by local people and improve attitudes towards wildlife (S. S. Románach, R. Woodroffe & P. A. Lindsey, unpubl. data), although care would have been required to prevent fictitious problem animal reports being filed. However, experience from Zimbabwe suggests that revenues from problem animal hunts on communal land reduce the number of animals killed, because of appreciation among local people of their economic value (Child, 2005).

The preferences of most clients emphasize the potential for trophy hunting to benefit conservation. However, the attitudes of some clients are likely responsible for problems associated with the hunting industry. For example, half of the clients consider guaranteed quality trophies as being important when selecting hunts, creating a large market for canned and put-and-take hunts. In South Africa, for example, an estimated 95% of lions hunted are 'canned' (Damm, 2005; Patterson & Khosa, 2005). Likewise, more than half of the clients are willing to hunt exotic species, creating market pressure for introductions, which can result in various negative veterinary, ecological and genetic consequences (Hamman *et al.*, 2003). In Namibia and South Africa, 95 and 54% of operators advertise exotic species (P. A. Lindsey, unpubl. data). Perhaps most disturbingly, a significant minority of clients would willingly accept illegal persecution of 'non-huntable' predators, carried out in the belief that this would improve trophy stocks. Reliance on market pressure to ensure 'conservation-friendly' hunting is thus clearly not enough. Effective legislation to control the

hunting industry and to regulate the activities of both hunting operators and clients is also required.

Client interest in hunting in multiple African countries

Client preferences confirm the potential for trophy hunting to generate revenues in countries that might otherwise be too remote or unstable to be attractive destinations (Wilkie & Carpenter, 1999a). Hunting clients are most interested in visiting southern and East African countries, which already derive significant revenues from trophy hunting. However, experienced hunting clients are interested in hunting rare antelopes or those with limited geographic ranges. Several such species only occur in countries other than the well-known East and southern African nations: mountain nyala are endemic to Ethiopia (Kingdon, 1997) and bongo and Lord Derby eland can only be hunted in Cameroon and CAR. Correspondingly, operators in those countries rely on advertising such 'flagship' species to attract clients (P. A. Lindsey *et al.*, unpubl. data).

There is considerable interest in hunting in Kenya, where trophy hunting was banned in 1977 because of poor controls and ethics on the part of the hunting industry (Outoma, 2004; Leader-Williams & Hutton, 2005). Since the ban, wildlife populations outside of parks have declined by at least 60%, due partly to the inability of local people to benefit from wildlife (Child, 2000, 2005). During the 1990s, Kenya lost US\$20–40 million per year of potential hunting revenues (Elliott & Mwangi, 1998; Hurt & Ravn, 2000). Kenya is viewed with nostalgia by clients as the 'home of trophy hunting' and operators could likely sell hunts at a premium and potentially create powerful incentives for conservation.

Trophy hunting where ecotourism may not be viable

Client preferences confirm that trophy hunting represents a potentially viable land use under conditions that are unsuitable for ecotourism (Wilkie & Carpenter, 1999a; Leader-Williams & Hutton, 2005). For example, most clients are willing to hunt in Zimbabwe at present, supporting the suggestion that trophy hunting is relatively resilient to political instability (Leader-Williams & Hutton, 2005). In the first year of the Zimbabwean land seizures, the tourism industry shrank by 75%, compared with a drop of 12% in hunting revenues (Booth, 2002; Bond *et al.*, 2004). Likewise, trophy hunting continues in parts of Central Africa (e.g. in CAR) that are probably too insecure and remote for successful ecotourism (Wilkie & Carpenter, 1999b).

Most clients are willing to hunt in areas lacking high densities of viewable wildlife, and those inhabited by local people and livestock, confirming the potential for trophy hunting to generate incentives for conservation on communally owned lands. Because clients are willing to hunt in areas with depleted wildlife populations, and because trophy hunting requires only limited off-take of populations, hunt-

ing revenues can play a potentially important role in habitat rehabilitation and community development. For example, trophy hunting provides a key entry point into wildlife ranching for livestock farmers in southern Africa (Bond *et al.*, 2004), and in Mozambique revenues from trophy hunting are helping to rehabilitate the *Coutada* hunting areas that were depleted during the civil war (Hatton *et al.*, 2001). The willingness of most clients to hunt where people and livestock are present could be perceived as conflicting with their stated desire to hunt in wilderness areas. However, clients often indicated that they enjoy experiencing local African culture, and we believe that the presence of people leading traditional lifestyles in remote areas may even enhance the 'wild' feel to an area among western hunters.

Concluding remarks

The preferences of hunting clients highlight the potential for trophy hunting to create incentives for wildlife conservation and community development in Africa, in multiple countries, including those where ecotourism may not be viable, and in areas within well-visited countries that are off the tourist circuit. Given the ability to select among operators in terms of commitment to conservation and community development, client preferences could drive positive change in the hunting industry. However, the attitudes of a minority of clients likely cause several problems currently associated with trophy hunting, stressing the importance of effective regulation of hunting operators and clients.

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Supplementary material

The following material is available for this article online:

Appendix S1 Hunting client questionnaire.

Appendix S2 Hunting operator questionnaire.

This material is available as part of the online article from <http://www.blackwell-synergy.com>