



Trophy hunting for wildlife conservation? On sport hunters' willingness to pay for conservation and community benefits

Anke Fischer^{*,**}, Yitbarek Weldesemaet^{**},
Mikołaj Czajkowski^{***}, Degu Tadie^{**},
and **Nick Hanley**^{****}

^{*}Social, Economic and Geographical Sciences Group, The James Hutton Institute, UK

^{**} Frankfurt Zoological Society, Addis Ababa, Ethiopia

^{***} Faculty of Economic Sciences, University of Warsaw, Poland

^{****} Dept. of Geography and Sustainable Development, University of St Andrews, UK

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Main ideas

- Perceived conflict between increased stocks of grazing domestic livestock animals in Ethiopia and wildlife conservation
- Decreasing wildlife in Ethiopia overall, due to agricultural conversion and, in some areas, overhunting (illegal)
- Some wildlife species are valued by international trophy hunters
- These hunters might be WTP for improved hunting opportunities which require *reduction* in grazing by domestic livestock
- They might also be WTP extra for packages which divert hunting fees to rural households, which can (more than) compensate them for loss of grazing income
- Increased revenue from trophy hunting could also move wildlife conservation up on the political agenda
- This means that we could use changes in trophy hunting management system to improve the conservation status of endangered wildlife *and* to improve the incomes of rural households.
- We employ a choice experiment to investigate.

- Trophy hunting, in the past, has been seen as a threat to wildlife populations, e.g., rhino, elephant...
- But given the scale of habitat change, it is now being seen as potentially able to contribute positively to achieving conservation goals (Dickson et al, 2009; IUCN, 2012)



How?

- (1) Designation of protected/hunting areas
- (2) Source of revenue for landowners which is dependent on wild animal populations
- (3) Economic argument for species conservation
 - Complement/alternative to non-consumptive wildlife tourism
 - Can see this working out in both developed and developing countries

- Trophy hunting can provide economic incentive for local people to invest in conservation of target species and their habitats (Jones, 2009)
- This depends on how fees etc. are distributed
- Benefit sharing schemes need to be carefully designed to be effective, esp. at local level (Yitbarek et al, 2013)
- Not many studies of such schemes, and all of them so far are ex post
- We take an ex ante approach, using choice experiments to study the properties of a potential new management scheme aimed at achieving development *and* conservation objectives.

Previous work

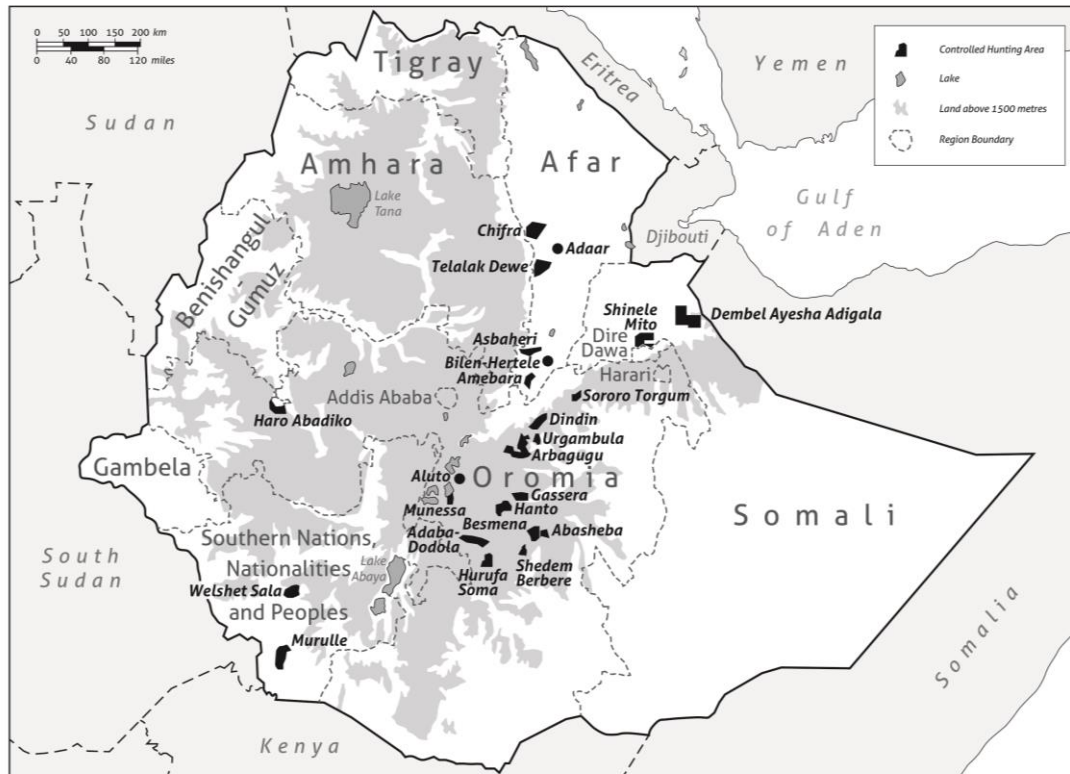
- Lindsey et al, 2006: US-based hunters' preferences for hunting trips to Africa
 - 86% said would prefer to hunt in areas where revenues shared with local community
 - But no analysis of trade-offs across trip attributes
- Sekar at al, 2014: analysis of actual expenditures across trip types in Tanzania.

Our study: Ethiopia

- Pressure on wildlife habitats increasing due to competing land uses
- Livestock grazing and conversion to cropland (Tadie and Fischer, 2013)
- Contrasts with high importance that conservation scientists place on Afro-alpine habitats in which are found many endemic species, such as mountain nyala and Walia ibex.
- Conservation of lowland habitats important for species such as white-eared kob
- No legal access to controlled hunting areas for domestic livestock for grazing, but happens anyway



Map of Ethiopia



There are currently 17 active Controlled Hunting Areas in three regions: Oromia, Southern Nations, Nationalities and Peoples' Regional State, and Afar. Additional Open Hunting Areas that are not allocated to any specific concessionaire can be found in the same regions.

Compared to the 20 National Parks in Ethiopia which cover an area of 45,418 km², the 17 currently active Controlled Hunting Areas only take up a relatively small area of the country (6,056 km²) with the Open Hunting Areas adding another 946 km²

Trophy hunting in Ethiopia

- The principal game species is the endemic mountain nyala (*Tragelaphus buxtoni*), with a trophy fee of currently USD 15,000 and a yearly quota of up to 40 animals.
- Menelik's bushbuck, an endemic species of the bushbuck (*Tragelaphus scriptus*), can be found in the same areas as the mountain nyala. Its trophy fee is currently USD 6000, and the annual quota can range between 20 and 40 animals.
- Government sets quotas and fees for a range of species each year
- Low level of hunting income relative to other Eastern African countries such as Tanzania



- Hunting controlled by federal EWCA, who issue permits, in collaboration with regional governments
- Designated Controlled Hunting Areas (n=24) are licenced (n=17) to safari companies
- Fees and quotas set annually by EWCA for each trophy species (54 mammal species, 49 bird species)
- More likely that experienced hunters will visit Ethiopia than first-timers.
- At present, 67% of hunters are from USA

- Currently, 85% of fees collected by central govt. are re-allocated to regional authorities
- However, only one of these regional authorities has a benefit sharing scheme for these revenues with local communities
- No plans at present to devolve wildlife management to local areas.

Our study

- CE of hunters' preferences for trips
- Questionnaire developed with hunters and safari companies along with staff of EWCA
- Sampling: target population is all international game hunters who might visit Ethiopia in future
- Used web site of international hunters' organisation to recruit participants, plus safari companies.
- Final sample size = 224

Attributes

- Bag mix (species allowed to shoot)
- Experience at hunting site (other wildlife; grazing livestock)
- Share of revenues to local community
- Share of revenues to government (national, regional)
- Trip length in weeks (*EWCA currently determines minimum length of trip for each species*)
- Trophy fees

Bag mix:

- (1) Mountain nyala and other highland game: You shoot one mountain nyala, and six other animals of the Ethiopian highlands; the exact species will depend on the available quota and cannot be selected beforehand, but your bag will include at least one of the following species: Bush pig, Bohor reedbuck or giant forest hog, Menelik's bushbuck.
- (2) Mountain nyala and lowland game: You shoot one mountain nyala in the highlands, and then move on to the lowlands and shoot eight lowland animals; the exact species will depend on the available quota and cannot be selected beforehand, but your bag will include at least two of the following species: Beisa oryx, Soemmering's gazelle, gerenuk, greater or lesser kudu.
- (3) Mountain nyala only: You shoot one mountain nyala in the highlands.
- (4) Nile lechwe and white-eared kob: You travel to the western part of the country and shoot one individual each of white-eared kob and Nile lechwe.

Each respondent completed 8 choices like the one below

Please mark your preferred options (only one from each choice card)

	A	B	C	D
<i>Bag mix</i>	Nile lechwe and white-eared kob	Mountain nyala and other highland game	Mountain nyala and lowland game	No trip to Ethiopia
<i>Experience of hunting site</i>	Some livestock and some wildlife	A lot of wildlife, no livestock	A lot of wildlife, no livestock	
<i>Share to community %</i>	0	20	30	
<i>Share to government %</i>	40	30	10	
<i>Length of trip</i>	1 week	4 weeks	2 weeks	
<i>License fees</i>	10,000 USD	40,000 USD	20,000 USD	
Your choice?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Results

- Have estimated lots of different models
- Here we report RPL and MNL with interactions based on attitudinal statements
- 83% of respondents had hunted in Africa
- Only 15% in Ethiopia specifically
- 90% had >10 years' hunting experience
- Most (70%) were USA residents; 14% from Europe.

Variable	Mean effect (s.e.)	Standard deviation around mean effect (s.e.)
BAG2: mountain nyala + highland game	0.4914*** (0.1569)	0.1328 (0.4323)
BAG3: mountain nyala + lowland game	0.5049*** (0.1841)	0.9605*** (0.1605)
BAG4: white-eared kob and Nile lechwe	-0.7513*** (0.2798)	1.9930*** (0.2953)
EXP2: some livestock, some wildlife	0.6975*** (0.1669)	0.8717*** (0.2013)
EXP3: a lot of livestock, no wildlife	-0.1702 (0.2094)	0.9477*** (0.2449)
EXP4: a lot of wildlife, no livestock	1.3485*** (0.1646)	1.2563*** (0.2067)
COMSH: revenue share to communities	0.0306*** (0.0046)	0.0259*** (0.0066)
GOVSH: revenue share to government	-0.0148*** (0.0053)	0.0347*** (0.0077)
TIME: trip length in weeks	0.5595*** (0.0776)	0.1013 (0.1493)
SQ	-0.8603*** (0.3210)	2.9323*** (0.3118)
FEE: cost of a trip (in 1,000 USD)	-0.0755*** (0.0059)	0.0332*** (0.0044)
Model characteristics		
Log-likelihood		-1896.9373
McFadden's pseudo-R ²		0.2415
AIC/ <i>n</i>		2.0734
<i>n</i> (observations)		1851
<i>k</i> (parameters)		22

WTP for changes in target species
(relative to mountain nyala, in USD)

Change in attribute	WTP (s.e.)	95% confidence interval
BAG2 – other highland game (in addition to mountain nyala)	6,330 (1,880)	2,550 – 9,830
BAG3 – lowland game (in addition to mountain nyala)	6,460 (2,210)	1,930 – 10,680
BAG4 – Nile lechwe and white-eared kob (instead of mountain nyala)	-9,650 (3,600)	-16,790 – -2,590

WTP for trips with varying levels of domestic livestock and/or other wildlife
(relative to none of either, USD)

Change in attribute	WTP (s.e.)	95% confidence interval
EXP2 – some livestock and some wildlife encountered during a hunting trip	9,040 (2,320)	4,650 – 13,800
EXP3 – a lot of livestock and no wildlife encountered during a hunting trip	-2,170 (2,710)	-7,600 – 3,150
EXP4 – a lot of wildlife and no livestock encountered during a hunting trip	17,380 (2,580)	12,790 – 22,850

WTP for change in distribution of hunting fees (USD)

Change in attribute	WTP (s.e.)	95% confidence interval
COMSH – one percentage point of hunting fees redistributed to local communities	390 (70)	270 – 540
GOVSH – one percentage point of hunting fees redistributed to the central government	-190 (70)	-320 – -50

Observed preference heterogeneity

- Views on political stability of Ethiopia: more unstable, less willing to share revenues with govt.
- Interest in cultural heritage: more likely to prefer mix of highland and lowland hunting
- Interest in nature conservation: stronger preference for seeing other wildlife, less negative about revenue sharing
- Nationality: US/Canada stronger preference for packages including mountain nyala. Preferred longer trips
- No effects from length of hunting experience

Qualitative analysis

- Respondents interested in Ethiopian wildlife and nature, but put off by procedural aspects of hunting governance
 - high prices, low quotas
 - restrictive trip lengths
 - non-refundable fees and abrupt price increases
- Presence of grazing domestic animals decreased pleasure of trip
- Lack of “other wildlife”

“Ethiopia is a great country and a fine destination to hunt. The problem is that human encroachment is seizing the habitat of wildlife. I saw huge change between my 2 safaris and it is heartbreaking.”

“Villages and communities should always get the largest share not the government. It is the only real way to stop poaching by making the animals more valuable to be conserved and for hunting. There should never be a package where they get nothing.”

Conclusions

- Can trophy hunting help wildlife conservation?
 - Our hunters were WTP substantial amounts for experiences where there was increased revenue sharing with local communities....
 - ...\$4,000 per trip extra per 10% given to locals...
 - ...but this would need to go along with a reduction in domestic grazing in hunting areas, and an improvement in habitat quality.
 - Big WTP for hunting trips where can see more wildlife other than the things you are trying to shoot
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- Needs a self-enforcing system of governance at the local level.
 - Low price elasticity of demand implies that fees could be raised anyway, without reducing revenues to the EWCA. But only if the rest of the package is “right”.

- Contact ndh3@st-andrews.ac.uk