

## WP3 Economics

Economics can help us understand conservation conflicts, by quantifying who gains and loses from different management actions, and how large the benefits and costs are to different groups. Economics also helps us design better conservation policy, through modelling the effects of changes in incentives on people's behaviour. Finally, economics provides insights into the drivers of illegal hunting and land management behaviours, whether it be the poisoning of raptors on a Highland sporting estate, or illegal bushmeat hunting by low-wealth households in the Serengeti.



### 3.1 The values associated with hunting – summary of key messages

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##### Scotland

The overall focus of the research has been the implications of different ways of managing heather moorland on shooting estates, in terms of the intensity of management. Intensity can be thought of as an index of the effort (inputs) applied to a piece of land or in terms of expected outputs of grouse. Two choice experiments were undertaken with members of the Scottish general public, focussing on the conflicts between grouse and hen harriers. We found out that Scottish citizens are willing to pay for increases in both hen harrier and golden eagle populations on moorland by changes to current management. The majority of respondents wanted a change away from the current means of managing conflicts. In a choice experiment on non-hunting recreational users of one moorland area – the Cairngorms national park – we explored the preferences of visitors for changes in landscape appearance, bird populations and employment on sporting estates. Trade-off rates were calculated for each pair of attributes, and these showed that recreational visitors would be willing to trade off a reduction in employment on sporting estates for a large enough increase in moorland bird populations. However, other things equal, visitors preferred options which maintained or increased employment.

We then undertook a choice experiment on hunters which comprised the following attributes:

- Whether a walked up or driven shoot was offered
- Price charged per brace of grouse shot
- Impacts on wader populations on moorland

- Impacts on raptor populations
- Nature of landscape, in terms of intensity and coverage of muirburn

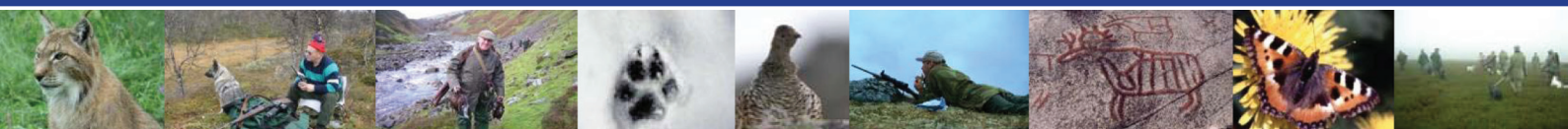
We found that the average hunter prefers a driven shoot, more waders rather than a decrease, fewer raptors, and lower prices, but is indifferent to the variations in landscape quality in the experimental design. Using a latent class model to allow for different groups of hunters by preference, we found evidence of four such groups in the data. This shows that there exists a significant sub-set of hunters (43% of the sample) who would prefer (and thus be willing to pay for) a less intensive shooting experience with higher wader numbers. Almost all hunters, however, prefer scenarios with fewer raptors, an indication of concern over competition for grouse.

From a policy perspective, the results are of interest as they quantify the general public's willingness to pay for changes in birds associated with moorland, and also indicate that public support would likely follow proposals to reduce negative impacts of land management on biodiversity (and thus would support positive impacts). If PES schemes were introduced on moorlands aimed at increasing biodiversity, this study provides some evidence for the likely economic benefits from such a policy.

##### Tanzania

In Tanzania, we focussed on illegal bushmeat hunting in the Western Serengeti. Two stated preference exercises were under-

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taken. In the first, we surveyed households to investigate their willingness to exchange different livelihood options, including bushmeat hunting, employment and cattle ownership. We also included measures of the risks of illegal hunting. We were able to quantify the rates at which the average household would be willing to exchange a reduction in the time spent hunting per year for increases in cattle, wages from outside employment and access to micro-credit schemes. However, we also found important variation in the attitudes to risk and in the value of a week's hunting across households. One factor explaining this variation was household wealth. The policy implication is that a range of factors need to be taken into account in designing interventions to reduce illegal hunting, including the need for reliable alternative sources of income. Interventions will also need to be differentiated across households for maximum effectiveness.

A second stated preference exercise modelled households as buyers of illegally-hunted bushmeat, and investigated the likely effects on their buying behaviour of (i) increases in the price of bushmeat and (ii) reductions in the price of two protein substitutes, namely chicken and fish. Our results quantify the likely reductions in household bushmeat demand through changes in either the own price of bushmeat or in the price of substitutes. For example, we found that a 1% change in bushmeat price leads to a decrease in the quantity of bushmeat demanded roughly equal to 0.7–0.9%. A 1% decrease in fish price is associated with 0.4% decline in the quantity demanded for bushmeat, while a 1% decrease in chicken is related to a decrease of bushmeat demanded of about 0.3%. This suggests that either alternative protein source could be promoted as an alternative to bushmeat.

## Spain

In Spain, a hedonic price exercise looked at the determinants of market prices for a day of red-legged partridge hunting experience. It was found that there is no significant difference between the price for a hunting day of farm-bred partridge and a hunting day of wild partridge, thus reflecting some equilibrium in the market. Since the average number of partridge hunted in a typical day tends to be higher when the birds are farm-bred, results are according to expectations and to the focus groups conducted, i.e. that hunters value more a wild partridge game than a farm-bred one.

A second study was conducted in Spain, involving a choice experiment survey among hunters, to explore the implicit value of some characteristics of the partridge hunting estates. Results suggest that the average maximum willingness to pay (WTP) for hunting an additional farm-reared partridge was of near 10 euro in 2012 values (9.95 euro). However, the marginal WTP for hunting a wild-stock partridge rose to circa four times more (38.72 euro). The difference in WTP for a walked-up shooting day with or without the opportunity of hunting other game, like rabbit or hare, for example, is estimated in 177 euro. Hunters would like to pay relatively more for a day in a hunting estate of central Spain that contains Mediterranean scrub (ca. 140 euro for a day). In contrast, the WTP for a site that contains important non-game fauna is near three times less: 55 euro.



Results are potentially useful to estate managers and policy makers with a particular interest in nature conservation.

## Croatia

A Croatian application, consisting of a hedonic price exercise for bear hunting trophies, was conducted in 2011. Among other things, results show that, on average, hunters from outside Croatia spend 135 euro extra per bear hunted than the Croatian nationals. Also, hunters are more likely to spend more money if the hunting unit is strong in complying with legality aspects and facilitates the documentation for exporting the trophy, which tend to increase the WTP of the hunters in some 60 euro per bear.

## Read more in:

Hanley, N., Czajkowski, M., Hanley-Nickolls, R. and Redpath, S. (2010) Economic values of species management options in human-wildlife conflicts: hen harriers in Scotland. *Ecological Economics* 70: 107–113.

Riera, P., Mahieu, P.-A. and Garcia, D. (2012) Hunting valuation and property rights. In: Falque, M. & Lamotte, H. (eds.) *Biodiversité. Droit de propriété, économie et environnement/ Biodiversity. Property rights, markets and environment*. Brussels: Bruylant

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