



Analysis

Stated preferences for tropical wildlife conservation amongst distant beneficiaries: Charisma, endemism, scope and substitution effects

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ABSTRACT

Despite heightened awareness of the need to find additional resources for tropical biodiversity conservation, and recognition that the benefits to populations in developed countries may be significant, very few empirical studies have been conducted to estimate these values. In this article, we report the results of a choice experiment survey that investigated the preferences of UK residents for the conservation of threatened wildlife in the Eastern Arc Mountains in Tanzania, part of the Eastern Afrotropical “biodiversity hotspot”. We examine the sensitivity of values to species types, the number of species, the number of conservation sites and, more unusually, to potential substitutes/complements. Critically we find some evidence of coherency in preferences. Respondents are willing to pay significant, positive amounts to conserve charismatic and/or endemic species and are scope sensitive to the number of endemic species. In contrast, species which are neither endemic nor charismatic, and the number of conservation sites, do not contribute significantly to utility. Further, changing the overall scope of the ‘good’ is found to have a significant and differential impact on respondent’s choices depending on the species type: as the availability of wildlife increases, we observe substitution effects for non-endemic charismatic species, and complementarity for endemic (non-charismatic) species.

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1. Introduction

Tropical biodiversity continues to decline at unprecedented rates (Balmford et al., 2003; Butchart et al., 2010). Urgent action is required to tackle the direct and indirect drivers of loss and mainstream the economics of biodiversity (and ecosystem services) into development, decision-making (CBD, 2010a). This is expected to require the mobilisation of substantial resources (financial, human, and technical), and in particular, increased financial flows between developed and developing countries (CBD, 2010b).

Whilst the conservation of tropical wildlife may generate significant ‘existence’ value to populations in distant ‘donor’ countries like the United Kingdom, very little is known about the size of these values. In view of the current funding crisis this represents a significant gap in knowledge. Indeed such information may be of

considerable value, for example, to stimulate much needed increases in financial (and technical) resource transfers, in market creation, raising public awareness and, in informing the necessary trade-offs between what can and cannot be conserved.

The only way to directly estimate these values is using Stated Preference methods which ask the public directly to express their preferences for such non-market goods. But, are stated preferences a sound basis for determining policy priorities for tropical wildlife, a remote and complex good? Two issues seem particularly salient. Firstly, what motivates willingness to pay (WTP) for the ‘existence’ value of wildlife conservation in remote locations? Historically, conservation organisations have used charismatic species as ‘flagships’ for raising funds and public awareness but is ‘charisma’ all the public care about, and what about other more scientifically/ecologically important characteristics, for example, endemism, the number of species, and the number of sites?

Secondly, but of critical importance, is whether the stated preferences of distant beneficiaries for tropical wildlife conservation are coherent and rationale in terms of economic theory. Obtaining valid and reliable estimates for such goods raises a number of methodological challenges to valuation practitioners and presents a more cognitively

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demanding task to respondents than is encountered under the elicitation of values for local, familiar and/or less complex goods. An initial concern is whether, when faced with previously unknown and complex goods, respondents are able to ‘discover’ theoretically consistent preferences (as per [Plott, 1996](#)) or instead use available heuristics to ‘construct’ responses which are susceptible to framing effects and thereby fail tests of procedural invariance (as per [Slovic, 1995](#)).

In seeking to distinguish between the former theoretically consistent preferences and those that are inadmissible within wider cost benefit analyses (CBA) a commonly employed consistency test is to examine the scope sensitivity of valuations ([Arrow et al., 1993](#)). Whilst we examine scope sensitivity, we argue that it is flawed and insufficient in that a finding of mere statistically significant differences in willingness-to-pay as scope changes does not imply that the degree of sensitivity is reasonable and sufficient. To address this failing we extend our survey design to allow tests for substitution (and/or complementarity) effects. Economic theory provides the clear expectation that WTP should decline as the availability of a substitute increases (and the converse in the presence of complements). Despite the fundamental nature of such a relation, substitution is rarely considered within stated preference (SP) methods and in particular in choice experiment analyses.

Correspondingly, in this paper we undertake an in-depth investigation of what drives WTP for non-use values of wildlife conservation in distant locations, and we assess the theoretical consistency of preferences by examining value sensitivity to: the number and type of species, the number of conservation sites, and the presence of potential substitutes (/complements). We approach the above issues using a split-sample choice experiment (CE) survey which elicits WTP for (i) conserving wildlife in the Eastern Arc Mountains of Tanzania, and (ii) a larger good, that includes conserving wildlife in the Eastern Arc and in the Cameroon Highlands. The above effects are investigated with respect to preferences for conserving endemic versus non-endemic species, and charismatic versus non-charismatic species.

2. Literature review

There are very few stated preference studies on the value of remote biodiversity; those that do exist indicate that respondents in developed countries are willing to pay significant positive amounts to conserve tropical wildlife. In most cases these studies have focused on charismatic species, for example, the Black Rhino or African elephant, or on specific biodiversity-rich ecosystems, such as, rainforests ([Horton et al., 2003](#); [Kramer and Mercer, 1997](#); [Rolfe et al., 2000](#); [Svedsater, 2000](#); [Swanson and Kontoleon, 2003](#)). For example, [Horton et al. \(2003\)](#) report that Italian and UK residents are willing to pay on average £30 per household per annum to conserve biodiversity in the Brazilian Amazon. Very little is known about the size of values for other remote wildlife, for example, uncharismatic but endemic species, species which are neither endemic nor charismatic, nor about how the public might prioritise between different types of species in a remote setting. Such information is expected to be of considerable value to the ongoing debate over how to prioritise the scant resources available for tropical conservation, and in creating appropriate value capture mechanisms.

With regard to the valuation of local (or domestic) wildlife, the literature indicates that respondents are sensitive to certain types of wildlife, in particular, respondents are willing to pay significantly more for ‘charismatic’ or ‘flagship’ species compared with uncharismatic ones (see [Richardson and Loomis, 2009](#); [White et al., 2001](#)). This is consistent with the fund-raising approaches used by international conservation organisations which typically focus on mega-fauna (for example, the Giant panda or tiger in Asia, and elephant or rhino in Africa) – notably, the generated funds may also be used to conserve other species (see [Tisdell, 2011](#)). Moreover, there is also an ecological importance to such approaches because some

charismatic species function as ‘keystone’ or ‘umbrella’ species, providing wider conservation benefits. However, this is case-specific, and a recent study reports that many threatened species, in particular, those which are uncharismatic or poorly known currently receive little or no conservation action ([Clucas et al., 2008](#); [Sitas et al., 2009](#)). It has been suggested that ‘flagship fatigue’ could result in these less traditional (i.e. uncharismatic) species holding appeal to the public (see [Clucas et al., 2008](#)). Indeed, [Ressurreição et al. \(2011\)](#) and [Veisten et al. \(2004\)](#) find that local ‘low profile’ endangered species such as fish, algae, invertebrates, fungi, lichen and mosses may attract significant positive WTP. However, it remains to be seen whether this holds amongst distant beneficiaries too.

The situation is even less clear for endemics. Whereas a recent meta-analysis found that endemism did not significantly influence WTP ([Martin-Lopez et al., 2008](#)) – preferences mostly favoured anthropomorphic and anthropocentric characteristics instead of scientific factors – [Meuser et al. \(2009\)](#) find that endemism is the most important determinant of WTP. Given that their focus was on local socio-political endemics (rather than true endemics), the authors postulate whether it is endemism per se which is being valued or rather the value associated with a particular (proximate) place – they recommend that future work should examine whether residents in other jurisdictions value endemism over non-endemism.

We seek to add to this work by examining whether UK residents far removed from tropical endemic species value their protection over non-endemics; we also assess whether tropical species which are neither endemic nor charismatic generate significant positive WTP; and whether preferences are held for maintaining multiple conservation sites.

A corollary and critically important objective is to examine the theoretical consistency of such preferences. It has been argued that the public may be too unfamiliar with biodiversity and its various indicators to meaningfully interpret how changes in its provision might affect them ([Spash and Hanley, 1995](#)). Critics contend that in such instances respondents may construct their preferences in relation to the format of the elicitation setting or “clues” provided by the survey instrument or simply be random ([Gregory et al., 1993](#); [Vatn and Bromley, 1994](#)). For example, [Bateman et al. \(2008\)](#) report evidence of asymmetric dominance effects in a choice experiment study of preferences for increasing plant and birdlife around a Norfolk lake – respondents choice behaviour and the resulting welfare estimates were significantly affected by the inclusion of a ‘decoy’ in the choice sets. As a result of such concerns, much of the empirical literature on biodiversity valuation has focused on testing the robustness of preferences by examining the impact of varying various aspects of the experimental design. The problem is that very few studies undertake rigorous tests of the theoretical consistency of values. Instead, many rely solely on the use of scope tests. This involves examining whether WTP significantly increases (decreases) with an increase (decrease) in the quantity or quality of the good being valued. However, there is mixed evidence of this in the empirical literature (see, for example, [Boyle et al., 1994](#); [Carson and Mitchell, 1995](#); [Giraud et al., 1999](#); [Horton et al., 2003](#); [Loomis and White, 1996](#); [Veisten et al., 2004](#); [White et al., 1997](#)). The CE technique may hold some advantages over the contingent valuation method (CVM) in that it internalises some of the smaller scope effects by presenting respondents with different levels of each attribute (see [Hanley et al., 1998](#)). Of concern is that if WTP is invariant to changes in scope that this may provide evidence that people are not valuing the intended good but instead the experience of contributing to a ‘good cause’ i.e. moral satisfaction/‘warm glow’ ([Kahneman and Knetsch, 1992](#)),¹ or providing

¹ Alternative explanations include poor study design ([Carson and Mitchell, 1995](#)), questionable probability of provision, or mental models of joint products ([Schulze et al., 1998](#)).

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