

Allegato 4c_1

A contingent valuation approach for the estimation of the economic value of ibex and other alpine ungulates

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Introduction and the survey

The presence of charismatic wildlife in the Gran Paradiso National Park (Italy) is a crucial source of tourist attraction. In the framework of the Project “GREAT- Grandi Erbivori negli Ecosistemi Alpini in Trasformazione” (PNGP 2013), we conducted an economic valuation of the intrinsic value of the ibex and of the three major alpine ungulates: chamois, red deer and roe deer. We utilized the contingent valuation technique, extensively applied in the field of environmental economics. The perception of the existence of these species by the local population and tourists has important implications for conservation policies. This is the first time that a contingent valuation study is conducted in the Gran Paradiso National Park.

The objective of the study is the elicitation of the willingness to pay (WTP) for policies that may improve the conservation of the alpine ibex in the Gran Paradiso National Park. The target of the survey is composed by actual and potential users of the Park. We invited to an online survey all subscribers to the Park’s mailing list, Facebook account and Twitter account. The survey remained online for two months.

In order to explore the existence of the “embedding” phenomenon, we decided to test in two separate surveys the WTP for the ibex alone (hereafter Ibex Questionnaire) and for the four alpine ungulates which are the object of the Interreg GREAT project (hereafter Ungulates Questionnaire): ibex, chamois,

red deer and roe deer.

Each of the two questionnaires functions in the following way. Each respondent receives randomly one out of five bids pertaining the respondent's willingness to pay for the target species conservation policies: 3, 5, 7, 9 and 30 Euro. At the same time, the respondent is asked about the same bid to be paid through two different payment vehicles: a daily parking fee and an annual contribution to a special fund. A random process determines which of the two payment vehicles the respondent receives first. We explain that both payment vehicles would channel money that would be dedicated only to extra conservation measures for either the ibex or the four ungulates. We employ the elicitation technique called Double Bounded Dichotomous Choice (DBDC). It consists in asking subjects to vote YES or NO to sustain specific conservation policies either for the ibex or for the four ungulates at an initial bid price, as if they were voting in a referendum. If the individual votes YES he/she is asked to respond in a follow-up stage to a higher bid value for the project. If he/she votes NO, the follow-up stage offers a lower bid value.

Subsequently, respondents receive questions on the following topics: motivations for answering YES or NO to the bids (both closed and open questions); importance given to conservation in general; level of knowledge of the Gran Paradiso National Park's goals and activities; intensity of use of the Park amenities; distance of residence from the Park; frequency of wildlife sightings in the Park; knowledge about the ibex or the four ungulates; socio-demographic features.

Before introducing the bid questions, the survey briefly explains the history and the present situation of the ibex and of the four ungulates.

Results

We obtained 433 complete responses to the Ibex Questionnaire, and 357 to the Four Ungulates Questionnaire. From the Ibex Questionnaire we observe that a large majority of respondents thinks that the ibex has a symbolic value superior to the one of other wildlife species, argues that nature and wildlife protection are extremely important, and is ready to contribute to a conservation program even if most other people would not. 40% of respondents think that it would be correct to dedicate a conservation programme to the ibex alone. 47% do not agree on the fact that only public institutions should take care of environmental protection, while 39% think that it should be so.

We register a high percentage of relatively frequent users of the Park among respondents (41% of

respondents visit the Park three or more times per year, 14% visit the Park twice a year, 15% once a year, and 29% less than once a year. 36% of respondents saw ibex three or more times in the past year, 34% once or twice, 27% did not see any ibex.

Moreover, 49% of respondents declared that they provide donations for nature conservation at least once a year. 77% think that habitat preservation is the most important goal of the Park, while only 31% think that the principal task for the PNGP is the maintenance of infrastructures and recreation services for tourists.

Bids results

In the results from the questionnaires proposing a parking fee as a payment vehicle we register a clearer inverse relation between the bid amount and the percentage of positive answers than in the case proposing a contribution to a conservation fund. This holds for both the ibex and the four ungulates cases. In the conservation fund case, positive responses do not tend to decline when the amount of the bid grows. In general, a contribution to the conservation fund receives slightly higher YES rates than the introduction of a parking fee.

The Ibex Questionnaire receives a higher percentage of YES responses than the Ungulates Questionnaire, on all bids. This is particularly true for the percentage of YES responses to the bid ‘3 Euro for a Conservation fund for the ibex alone’, which is 10% higher than the one for the four ungulates. The percentages of YES responses to the bids ‘9 Euro for a conservation fund’ and ‘30 Euro for a conservation fund’ in the ibex case are respectively 2% and 4% higher than those registered in the bids for the conservation policies targeted to the four ungulates together.

This phenomenon is even more marked in the parking fee option. The bids ‘introduction of a 4 Euro daily parking fee’ and ‘introduction of a 9 Euro daily parking fee’ earmarked to conservation of the ibex alone receive YES response rates respectively 20% and 23% higher than those registered in the questionnaire formulated in terms of the four ungulates.

This provides evidence of the so-called “embedding effect”, well known in the contingent valuation literature: respondents tend to consider the four ungulates as a whole and to express the value they assign to wildlife in general even when they are asked about their willingness to pay for conservation of the ibex alone.

The fact, however, that the percentage of YES responses in the ‘ibex alone’ case is not just as high, but indeed higher than the one in the ‘four ungulates’ case indicates that also a “flagship species effect” is at work. This means that the extra value that emerged for the ibex with respect to its ungulate group derives from the symbolic and charismatic role assigned to it by Park actual and potential users.

The value given by respondents to the conservation of ibex and other ungulates in the Park appears to be related to the frequency of visits per year and to subjective environmental motivations. Expectedly, also the payment vehicle matters: a parking fee imposes a higher cost on frequent users than a once-a-year donation to a conservation fund. In fact, the majority of frequent visitors (three or more visits per year) answers NO already to the first parking bid, whereas more than half of sporadic users (less than one visit per year) answers YES to the first parking bid.

The attitude towards contributions to a conservation fund appears highly positive (75% of positive responses) and is similar between frequent and sporadic users of the Park. Clearly, this payment vehicle is not linked to the intensity of use. Responses to the open question confirm that respondents tend to prefer making a donation to a conservation fund rather than spending the same yearly amount in a parking fee, although earmarked to conservation policies. The former is perceived as less of an imposition and as a more equitable payment vehicle.

Responses by sporadic users also provide interesting insights. Although they also show a preference for the conservation fund with respect to the parking fee, the majority of them answers YES to the first bid in both cases. This means that there is a perceived positive component of existence value of the ibex, among respondents, beside the pure use value.

The impact of the frequency of Park visits on responses shows a similar pattern in both the Ibex Questionnaire and the Ungulates Questionnaire.

The series of questions pertaining subjective environmental motivations of respondents allows us to highlight a few further elements. First, the respondents’ opinion on the opportunity of dedicating conservation efforts to the ibex alone *versus* to the ungulates as a unique wildlife category do not appear to be related to the willingness to pay and do not influence their preferences towards the payment vehicle.

Second, there does not appear to be a specific association between consideration of the ibex as a symbolic species and willingness to pay. The majority of respondents do think that the ibex plays a charismatic role in the Park, but 41.7% among these respondents answered NO to the first bid of the

parking fee option. A minority (17.7%) does not give the ibex a place of honor among alpine ungulates, but 59.7% among them answered YES to the first bid.

Third, there are unexpected associations between the stated importance given to nature in general and willingness to pay for conservation. A large majority (85.4%) of respondents considers nature protection very important and attaches high priority to it. However, 39.9% of respondents within this subset answered NO to the bid in the parking fee case; whereas 60% of those who declare not to place a high importance on nature are nonetheless willing to pay for a car park fee whose revenues would be spent in conservation policies.

Fourth, there is a marked tendency to declare that decisions about contribution to wildlife protection are to be taken individually, regardless of the behavior of others. Among those who declare to be ready to contribute independently from others' behavior, the majority answered YES both to the bids presented in the form of a parking fee (62.7%) and in the form of a contribution to a conservation fund (85.5%). However, this trend is not always associated with a consistent stated willingness to pay. For example, among those who answered NO to the bids in the conservation fund case, about half (50.9%) declare to be ready to contribute for nature even if most others do not.

Mean Willingness to Pay values

The mean individual WTP estimated for conservation policies targeted to the ibex only, in the survey based on the parking fee payment vehicle, is of 13.49 Euro (Single Bounded) and of 10.85 Euro (Double Bounded). The mean estimated WTP for conservation policies targeted to the four ungulates is 7.91 Euro (Single Bounded) and 7.42 Euro (Double Bounded) (Table 1). In the survey based on the conservation fund as a payment vehicle, we consider only the results of the Double Bounded setting. Since a number of respondents much higher than expected answered YES to the highest bid (30 Euro), technically we could not build the correct preference distribution and the resulted WTP values were misleading. Using the Double Bounded technique, instead, we were able to identify the WTP distribution within a correct range of values. The resulting mean WTP for a contribution to a conservation fund is 27.28 Euro if the fund is targeted to the ibex alone, and 23.84 if targeted to the four ungulates.¹

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One should note that the parking fee would be per visit, while the contribution to a special fund would be per year. Further developments of this research aimed at clarifying the relationship between these two payment vehicles include weighting ex-ante individual WTP for a parking fee by the number of visits per year, and weighting ex-post mean WTP by the number of visits per year.

	Payment vehicle	Ibex	Four Ungulates
Sample size (N)		433	357
Single Bounded	Daily parking fee	13.49 Euro	7.91 Euro
Double Bounded	Daily parking fee	10.85 Euro	7.42 Euro
	Conservation fund	27.28 Euro	23.84 Euro

Table 1. Mean willingness to pay (WTP) in the Single Bounded and Double Bounded cases, for the ibex and for the four ungulates

In both the parking fee and the conservation fund cases the WTP for policies aimed at protecting the ibex alone is higher than that for the four ungulates. As explained in § 2.1, these observations provide strong evidence of “embedding” and “flagship species” effects. In general we can argue that these results are to be understood as a value that Park users give to wildlife in general, with the ibex serving as a privileged channel for expressing this value.

Uses of WTP estimates

The estimated monetary amounts for the WTP presented above may provide multiple interpretive keys on the perceptions of park visitors and represent an informational support for different policy uses.

Firstly, the estimated WTP represent an assessment of the value that Park users and potential users place on wildlife, with particular focus on the Ibex. Park management authorities could use this information, for example, in support of conservation fundraising activities at the national and international level. These values of individual WTP can be used to estimate total WTP, when correct estimates of the number of visitors per year are available.² Some of the response patterns highlighted

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In the full report we use to this purpose data on tourist flows provided by PNGP (2012), Bilancio di Sostenibilità, <http://www.pngp.it/bilancio-sostenibilita>

above are particularly relevant in this case. A positive response in terms of willingness to pay appears to be independent from the frequency of visits, and the majority of sporadic users is willing to contribute to conservation, both for the ibex and the four ungulates together, through a parking fee as well as through a donation to an *ad hoc* conservation fund. This means that a high share of respondents attach a consistent existence value to alpine ungulates, independently of their personal benefit from wildlife viewing.

Secondly, this study provides indications on the perception by park users of different potential fundraising channels. The creation of an *ad hoc* conservation fund appears to receive higher consensus and gathers a higher stated willingness to pay than a parking fee. On the one hand, since the fund would be based on voluntary contributions, the actual fundraising would be more uncertain and volatile than that achievable through parking fees. On the other hand, the mean willingness to contribute to a conservation fund appears to be high, in absolute terms and with respect to the one for a car park fee. Which one of these two elements prevails in reality would determine the relative success of each fundraising strategy.

Thirdly, should the Park consider a real introduction of parking fees, then a price situated in the range between 3 and 5 Euro per day would generate the least disagreement among users. One option would also be the collection of parking or entrance fees through unmonitored boxes, as it happens in most Canadian national parks. This solution would bring lower revenues compared with a monitored, compulsory parking fee, but it would achieve a higher level of consensus among users. Qualitative answers given by the respondents in the open questions highlight that, should the Park actually consider the introduction of parking fees, informational and transparency initiatives on the purpose of the action and the use of revenues would be critical to achieve consensus among users.

Fourthly, the evidence of “embedding” and “flagship species” effects suggest that focusing on single species conservation initiatives is a better communication strategy, on the part of the Park, with respect to more general conservation initiatives.