ANALYSIS

Users and non-users of conservation areas: Are there differences in WTP, motives and the validity of responses in CVM surveys?

Matleena Kniivilä *

University of Joensuu, Faculty of Forestry, P.O. Box 111, FIN-80101 Joensuu, Finland

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ABSTRACT

It is commonly assumed that respondents’ lack of familiarity with the valued resource causes invalid and unreliable responses in contingent valuation surveys. With non-users’ valuations, mainly motivated by non-use values, the issue is also closely linked to the discussion of the measurement of non-use values. This paper re-examines the impact of previous use on respondents’ willingness to support nature conservation, their motives for valuing the resource and the validity of responses. The users’ and non-users’ characteristics differed, but there was no difference between the groups in their willingness to support sustained conservation. However, those planning to visit the area in the near future were more likely to pay for conservation than other respondents, even if they did not have previous use experience. Users considered their income constraint somewhat more carefully and were more aware of conservation-related issues than non-users. However, there was no difference in the validity of the WTP responses of the groups. Thus, there seems to be no rationale from a point of view of validity to restrict CVM analysis only to those individuals who have previous experience of the resource, which is in line with the basic premise of CVM. Furthermore, non-use values remained as significant motives for valuing the resource even if the use of the resource was intensive. Therefore, if the existence of a large non-use value component is considered as problematic in general, the problem is likely to exist for all respondent groups and not only for non-users.

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1. Introduction

A respondent's lack of familiarity with the valued resource has been discussed in contingent valuation literature (e.g. Desvousges et al., 1993; Carson et al., 2001). The validity, reliability and accuracy of non-experienced respondents’ responses has been questioned and discussed and scepticism is also presented concerning the non-users’ valuations (e.g. Cummings et al., 1986; Diamond and Hausman, 1993, see also Whitehead et al., 1995). As non-users’ motives are related to non-use values, including also option value, there is also a direct link to the fundamental discussion on monetizing other than use values.

As often a remarkable proportion of respondents to contingent valuation (CVM) surveys have no previous knowledge of the valued resource, the claim regarding invalid or unreliable responses is significant from the point of view of further use of WTP estimates and the credibility of the
contingent valuation method in general. However, despite the importance of this question, there are not many empirical studies related to this issue.

Previous use of the resource is a simple and unambiguous indicator of familiarity and is used in this study to examine the impact of familiarity on responses in CVM surveys. Existence of remarkable differences between users and non-users, especially in the validity of responses, but also to some extent in motives, would significantly weaken the justification for aggregation of WTP estimates to also include non-users, which is the normal practice in CVM studies. Furthermore, as non-users’ motives are basically non-use values, it would, in general, weaken the justification for including non-use values to non-market benefit estimation. This study aims at offering further insight into this controversial issue. The impact of use experience on the validity of WTP responses and the willingness to pay is examined. Also its impact on the main motives to value the resource is studied, specific interest being in the importance of non-use values. Furthermore, the main factors affecting the use of resources are examined.

The main hypotheses are as follows: (1) the use of the resource increases the validity of CVM responses, (2) the use of the resource and intentions to use it in the future increase willingness to support nature conservation. Furthermore, (3) users’ and non-users’ motives are expected to differ, yet, nevertheless, as an environmental asset is valued, non-use values are expected to be important even for very experienced users.

2. The impact of familiarity on responses in CVM surveys

Knowledge of and familiarity with the resource can be obtained via a survey instrument or by on-site or off-site use of the resource. Cameron and Englin (1997) classify these two main information types into exogenously provided information and information obtained endogenously. In CVM literature, the impact of information provided in a survey (i.e. exogenous information) has been studied intensively, some studies being also related to the impact of information on the validity of responses (e.g. Blomquist and Whitehead, 1998). Often, however, familiarity obtained by other ways, e.g. by using the resource, is ignored (Cameron and Englin, 1997), even if it may be an even more important factor affecting decision-making.

Familiarity with the resource may also include knowledge of the issue in a more general, wider context (Diamond and Hausman, 1993). Good knowledge of nature conservation will make evaluation of the relative importance of an individual area easier and WTP estimates more accurate. In addition, the respondents’ prior valuation and choice experience concerning the resource would be important (e.g. Cummings et al., 1986; Desvousges et al., 1993), but is seldom reached in CVM surveys.

It has been argued that a lack of familiarity with the resource leads to invalid or unreliable results, and to inaccuracy or less precise WTP estimates (Boyle et al., 1993; Diamond and Hausman, 1993; Boyle et al., 1994; Whitehead et al., 1995; Cameron and Englin, 1997). According to Johnson et al. (2001), knowledge of the resource and demand for information about damage are necessary conditions for compensable non-use losses. Consequently, aggregation is not reasonable over the full population, many members of it being unaware of the existence of the resource or damage. Whitehead et al. (1995) differentiate between three types of respondents — on-site users, off-site users and non-users — based on their familiarity with the resource and argue that WTP is less valid for respondents having no prior information about the resource and more reliable for on-site users. This conclusion is especially based on the finding that non-users do not consider their income constraints when stating their willingness to pay. Cameron and Englin (1997) examine willingness to pay for an abundance of trout and conclude that respondents who are more experienced in fishing also provide more precise WTP information. Blomquist and Whitehead (1998) also argue that information about resource quality results in more valid valuations.

It has been claimed that respondents cannot have well-defined preferences, in an economic sense, for goods with which they have no direct experience (Carson et al., 2001). However, Carson et al. (2001) note, according to standard micro-economic theory, that prior experience is not a precondition for rational decision-making, but that in existing markets people also have to make decisions concerning new goods for which they do not have any experience. In general, lack of validity may occur, e.g., due to part-whole bias, which more easily occurs if respondents generally do not have choice experience or knowledge of the object being evaluated (see e.g. Boyle et al., 1994). Also Gilbert et al. (1992) reported that embedding problems exist among non-visitors.

Cummings et al. (1986) have defined “reference operating conditions” relevant for the CVM and argue that in order to receive accurate WTP estimates, respondents must be familiar with the resource. Boyle et al. (1993) argue, based on their empirical experiment, that previous experience of a similar kind of resource improves the accuracy of WTP for alternative resource. They examine experienced and less experienced boaters and conclude that respondents with less experience are more easily affected by question order and that their values for hypothetical scenarios are statistically different from their values based on actual experience, which was not the case with more experienced respondents. Paradiso and Trisorio (2001) conclude that a direct knowledge of the good reduces the disparity between hypothetical and real WTP.

It is also argued that familiarity with the resource will impact upon the magnitude of WTP estimates. Cameron and Englin (1997) conclude that there is a significant increase in WTP when experience increases from zero. According to Bergstrom et al. (1990), an increased amount of information in the survey questionnaire increases WTP, but they point out that the type of information affects the direction of change. Furthermore, they argue that the impact of additional information is not an undesirable bias, but increases accuracy of valuations. According to Carson et al. (2001), direct users of the good are usually expected to be willing to pay more than those who do not use it. In the study of Boyle et al. (1994), hunters were also found to have a higher willingness to pay for
preventing migratory waterfowl deaths in oil holding ponds than other respondents. On the other hand, contrary to these studies, Turpie (2003) found no relationship between experience of protected areas and WTP for nature conservation in South Africa.

In general, users’ higher willingness to pay, if at all, may be caused by a willingness to use the resource also later, not only from some additional benefit received by using the resource or from “a better understanding” of the value of the resource. For example, Walsh et al. (1984) conclude that option value has more importance for users than for non-users and probability of visitation is positively associated with total preservation value. Furthermore, Stevens et al. (1991) found in their study that respondents who indicated a desire to fish for Atlantic salmon in the future are also more likely to be willing to pay for salmon restoration. These examples also illustrate the role of motives in WTP assessments.

3. Data and methods

3.1. Valuation object, questionnaire and sample

The empirical CVM application deals with nature conservation areas located in the municipality of Ilomantsi, in the province of North Karelia, in Eastern Finland. These conservation areas include two national parks, one strict nature reserve and several protection areas for old-growth forests and mires, the total area being 20,000 hectares (i.e. 7.2% of the land area of the municipality). These areas comprise approximately one third of similar kinds of conservation areas in the province of North Karelia and they host approximately 34,000 visitors every year. The national parks are the main attractions while the other areas are visited only by a minor number of visitors.

Data for the study was acquired using a CVM mail survey. In all, the questionnaire consisted of 22 questions, including the willingness to pay question in a discrete choice format, questions on the importance of non-use and use values, on the willingness to pay question in a discrete choice format, questions about the respondents’ socio-economic backgrounds while the other areas are visited only by a minor number of visitors.

The bid vector used was FIM 50–100–250–400–600–900 per person annually (EUR 8.4–16.8–42.0–67.3–100.9–151.4, respectively). In addition to “yes” and “no” answers, an “I don’t know” option was offered in accordance with the recommendations of the NOAA panel (Arrow et al., 1993). 25.1% of all respondents chose this option and, consequently, were not included in the analysis.

The main reasons for conservation in Ilomantsi and the characteristics of the areas were described. Maps of North Karelia and Ilomantsi were used to reduce an embedding effect and to clarify the valuation object. Before asking WTP questions, respondents were also asked to bear in mind that solely the conservation areas in Ilomantsi were being considered. Furthermore, respondents were reminded about their budget constraints and the existence of other projects they might be willing to support.

Two alternatives for the future use of the conservation areas were presented. The first alternative was the maintenance of the present conservation network. This would ensure the survival of valuable ecotypes as well as threatened species existing in the area, but would also require higher taxation to cover the costs of preservation. The second alternative was the abolition of conservation and the use of the areas for timber production, possible peat production or development for tourism (including infrastructure and housing construction) in the future. An increase in taxation would be avoided, but valuable habitats and species could be lost.

After describing the scenario, a discrete choice willingness to pay question on the willingness to support continued conservation was asked. Two different WTP questions were used. Sample 1 received a normal dichotomous choice WTP question that encouraged respondents to consider only their own welfare when assessing their willingness to pay the proposed tax change (the “consumer version” of questionnaire). Samples 2 and 3 received WTP questions that encouraged them to also consider the impacts of sustained conservation upon the whole of society (the “citizen versions” of questionnaire). The surrogate referendum question was used to emphasize the societal aspect, and, similarly, a personal tax change represented the cost of preservation. Sample 3 also received additional information about the social costs of conservation, which was not given in the other versions.

The actual voting question was: “Would you personally be willing to pay FIM X annually as an extra tax to ensure the sustained preservation of conservation areas in Ilomantsi also in the future?” Samples 2 and 3: The introduction to the question was as follows: “Consider the pros and cons of the alternatives solely from the point of view of your own welfare. Should it be necessary to collect additional funds for sustaining the conservation areas in Ilomantsi, would you be willing to pay an extra tax annually for this purpose?” The actual WTP question was: “If the sustained preservation of existing conservation areas in Ilomantsi would cause you an extra annual tax of FIM X, would you vote for their preservation?”

1 WTP question, sample 1: “Consider the pros and cons of the alternatives solely from the point of view of your own welfare. Should it be necessary to collect additional funds for sustaining the conservation areas in Ilomantsi, would you be willing to pay an extra tax annually for this purpose?” The actual WTP question was: “Would you be willing to pay FIM X annually as an extra tax to ensure the sustained preservation of conservation areas in Ilomantsi also in the future?” Samples 2 and 3: The introduction to the question was as follows: “Consider the pros and cons of the alternatives as a citizen from the point of view of your own welfare as well as the whole of society. If such a referendum were arranged, would you support the sustained preservation of conservation areas in Ilomantsi, if that meant for you an extra annual tax?” The actual voting question was: “If the sustained preservation of existing conservation areas in Ilomantsi would cause you an extra annual tax of FIM X, would you vote for their preservation?”
Respondents who had not visited the conservation areas chose “I don’t know” option more often than other respondents (30.6% vs. 21.6%). Non-response to the WTP question amounted to 2.8%. Two follow-up questions were used to identify zero or negative WTP, as well as protest answers. There was no significant difference between users and non-users in the share of protest responses or non-response.

### 3.3. Questions about motives and previous and intended use

After describing the valuation object, respondents were asked if they had visited some of those conservation areas, and if they had, how many times. Previous use was used here as an indicator of familiarity with the resource. Furthermore, respondents were asked if they had any intentions to visit any of them in the near future.

The importance of different non-use and use values as motives towards valuing conservation areas was studied by presenting the respondents with several claims that described possible reasons for valuing the resorts. The respondents were asked to evaluate how important each of the motives was for them. Claims presented bequest value, existence value, use value, option value and altruism. The exact wording is presented in Table 1. The scale used was 1–4, 4 representing that the respondent highly agreed with the claim and 1 that she totally disagreed with it. The questions were presented after the WTP question, but three other questions were between them.

### 4. Results

#### 4.1. Users of conservation areas

Characteristics of the users of conservation areas were studied using logistic regression (for details see e.g. Hosmer and Lemeshow, 1989). The model is presented in Table 2. The dependent variable in logistic regression is dichotomous and it is examined. Personal use of the resource was also considered to be the most concrete and efficient way to become familiar with the resource, and only the impact of actual use is examined. Personal use of the resource was also considered to be the most concrete and efficient way to become familiar with the resource.

The variable MALE has a value of 1 if the respondent is man, 0 for otherwise. AGE is the respondent’s age in years. The respondents’ general knowledge about conservation issues was examined by asking them to assess the truth regarding four claims concerning nature conservation. If the respondent had zero or one correct answer the variable KNOWLEDGE had a value of 0, 1 for otherwise. The dummy variable NON-LOCAL1 (reference variable) has a value of 1 if the respondent lives in Ilomantsi or in some of the municipalities nearby, NON-LOCAL2 has a value of 1 if respondent’s place of residence is the regional center Joensuu, and NON-LOCAL3 has a value of 1 if the respondent lives in some other part of North Karelia. Division into the groups is also a proxy for distance to the conservation areas. The dummy variables HOBBY1 and HOBBY2 represent the respondent’s activity in nature related hobbies. HOBBY1 has a value of 1 if the respondent often reads literature or articles related to nature or follows nature programmes on TV or radio, 0 for otherwise. HOBBY2 has a value of 1 if the respondent is active in nature related activities such as fishing or hunting, berry or mushroom picking, backpacking or other nature related sports or forestry.

According to the results men are more likely to be visitors of conservation areas in Ilomantsi than women. The probability to be a user also increases with the age. Even if users of conservation or recreation areas are often assumed and found to be rather young, in this study the result is relevant as no one under 35 years of age was among the respondents. However, when considering the impact of on-site use on WTP in the light of users’ characteristics, the situation is somewhat reverse as older people as well as local respondents are often found to be willing to pay less than others (e.g. Lockwood et al., 1993; Pouta et al., 2000). However, a general knowledge of the issue may also increase WTP (see e.g. Turpie, 2003).

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**Table 1 – To what extent do you consider the following claims valid for yourself?**

<table>
<thead>
<tr>
<th>Claim</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I value the conservation areas in Ilomantsi, because by them virgin nature is preserved for future generations. (Bequest value)</td>
<td>5</td>
</tr>
<tr>
<td>because I consider the existence of rare species and habitats in Ilomantsi important. (Existence value)</td>
<td>4</td>
</tr>
<tr>
<td>because I use them for refreshment, outdoor recreation etc. (Use value)</td>
<td>4</td>
</tr>
<tr>
<td>because I may use them in the future. (Option value)</td>
<td>4</td>
</tr>
<tr>
<td>because other people may use the conservation areas in Ilomantsi, even if I would not use them myself. (Altruism)</td>
<td>4</td>
</tr>
</tbody>
</table>

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2 Generally also variables describing off-site use might be useful indicators, but because of the role of major provincial media, all respondents were considered to have the same basic information about the resource, and only the impact of actual use is examined. Personal use of the resource was also considered to be the most concrete and efficient way to become familiar with

3 In this study, for statistical analysis SPSS and LIMDEP software were used.

4 Respondents were separately asked about their visits to each of the conservation areas (11 in all). If the respondent did not reply to a question concerning the particular area, she was supposed to have not visited there. If she failed to reply to all questions concerning previous visits, she was classified as a non-user. If the respondents who both skipped one or more questions concerning previous use of certain areas and indicated that they had not visited other areas and the respondents who failed to reply to all questions were excluded, there were only very minor changes in the results (Tables 2, 6, and 7).
4.2. Importance of non-use and use values as motives for valuing conservation areas

Motives for valuing the nature conservation areas of Ilo-
mantsi are presented for non-users, users and for intensive
users in Tables 3, 4 and 5. These tables include all responses,
including protesters and respondents who chose the “I don’t
know” option for the willingness to pay question. As the
willingness to pay question was presented before the
question examining motives, the framing of the WTP
question might have had an effect on expressed motives.
However, there was no difference in the motives at the 5%
risk level between those respondents who received the
consumer or citizen versions (two versions combined) and
therefore all versions are combined here.

Most of the respondents considered bequest and exist-
ence value and altruism as important motives for them-
selves. Use value and option value referring to the future use
of areas were less important. There was no difference
between non-users and users in the combined data
concerning the importance of bequest, existence or altruistic
motives. The result is interesting, especially because the
earliest studies of motives assumed that on-site users’
willingsness to pay was motivated solely by use values and
did not include non-use motives (e.g. Schulze et al., 1983;
Brookshire et al., 1983). Furthermore, there was no difference
between intensive users and non-users in the importance of
non-use values.5

As expected, there was a significant difference between
non-user and user groups in the importance of use and option
values (Pearson’s \( \chi^2 \) 364.86 and 66.22, \( p = 0.000 \)), users consid-
ered them more important. However, each of these values was
still very or fairly important for less than half of the users. Only
the most active users, i.e. intensive users, clearly regarded
them highly important. Intensive users’ valuations also
significantly differed in that sense from those of non-users
(Pearson’s \( \chi^2 \) 328.53 and 119.99, \( p = 0.000 \)). However, a part of
the respondents also indicated that none of the presented
motives for valuing areas is valid for them. 7.2% of the

5 “Intensive users” is a sub-group of users. An intensive user
might have visited e.g. once in the most of the 11 areas or more
than ten times in just two of the areas.

6 In this study the term non-use values refers to bequest value,
existence value and altruism, but not to option value.
understanding (see e.g. Cummings and Harrison, 1995). However, as a noticeable part of the respondents considered non-use values as very remarkable reasons for themselves to value conservation areas, it seems that non-use values are likely to be very important motivators for WTP. However, counter arguments have been presented, e.g., by Cummings and Harrison (1995).

4.3. The impact of use on the probability to support sustained conservation

The impact of previous or intended use of the conservation areas on the respondents’ probability to support sustained preservation was examined using a logistic regression model (Table 6). The dependent variable in the model has a value of 1 if the respondent accepted the proposed bid and 0 if she rejected it.

The variable NON-USER2 has a value of 1 if the respondent has never visited conservation areas in Ilomantsi, but is aiming to visit there in the near future (0 for otherwise). USER1 has a value of 1 if the respondent has visited the area, but has no plans to visit there soon again. USER2 has a value of 1 if the respondent has visited the area and aims to visit there again in the near future. The reference case is NON-USER1, which has a value of 1 if the respondent has neither visited conservation areas nor has any aims to visit them in the near future.

The variable BID is the proposed tax change. VERSION has a value of 1 if the respondent has received questionnaire version 2 or 3 (citizen versions without and with additional information, respectively), the reference version being version 1 (consumer version). The impact of the respondent’s personal income is examined by using dummy variables INCOME1–3, respondents who have the lowest income belonging to group 1 and medium income and high income respondents to groups 2 and 3, respectively. AGE is a dummy variable and has a value of 1 if respondent is over 50 years old, 0 for otherwise.

The variable CONSATT measures attitude towards nature conservation. It has a value of 1, if the respondent considers that nature conservation generally speaking is essentially needed, 0 for otherwise. Dummy variables ENVATT1–3 measure the respondent’s consideration about which issues should be concentrated upon more in social decision-making in Finland. ENVATT1 has a value of 1 if the respondent considers that economic issues should be emphasized more, ENVATT2 has a value of 1 if environmental issues should be given more attention and ENVATT3 has a value of 1 if current emphasis is good. The dummy variables MOTIVE1–3 measure the main motives for value conservation areas of Ilomantsi. As described earlier, only a small minority considered use values to be very important and thus the respondents are divided into only three groups based on their motives. MOTIVE2 has a value of 1 if the respondent considered at least one of the non-use values as a very important motive for him, but did not consider use or option values to be that important. MOTIVE3 has a value of 1 if the respondent considered either only use or option value or both use or option value and some of the non-use values as very important for himself. The reference case is MOTIVE1, which has a value of 1 if the respondent did not consider any of the proposed motives to be very important.

The model indicates no significant difference between previous users and non-users in the probability to support continued conservation (reference case NON-USER1: significance of USER1 0.8; reference case NON-USER2: significance of USER2 0.39). However, significant difference was found between the responses of persons intending to visit the areas in the near future and those who did not have those intentions, the former group being more likely to be willing to contribute. The difference was significant not only in the group of non-users (sig. 0.006), but similarly also in the group of users (sig. 0.006). The difference was most evident in the group of non-users, the odds ratio being 2.85, whereas in the group of users the odds ratio was 1.94. Thus, previous personal experience of the resource does not seem to have an impact on the respondent’s appraisal of the value of the resource or increase his willingness to preserve it. More important is the expected personal utility in the future and unwillingness to lose it. In order to retain the opportunity to use the resource non-users, in particular, seem to be willing to contribute.

As expected and as is logical, the model indicates significant difference in the probability to support sustained conservation between respondents who considered some of the non-use or use values as very important reasons to value conservation areas in Ilomantsi and respondents who did not consider any of them as very important (MOTIVE1 vs. MOTIVE2 and MOTIVE3). However, interestingly, there is no significant difference in the model between respondents valuing areas only because of non-use values and respondents valuing them because of use values or use and non-use values. To some extent, this may be explained by the rather general way motives have been measured here, but it also indicates that whilst respondents have some specific reason to value the

| Table 6 – Logistic regression model for support of sustained conservation |
|-----------------------------|-------|---------|---------|
| Reference: NON-USER1        | 1.048 | 0.006  | 2.851   |
| NON-USER2                   | 0.062 | 0.800  | 1.064   |
| USER1                       | 0.722 | 0.008  | 2.059   |
| Reference: ENVATT1          | 0.889 | 0.001  | 2.432   |
| ENVATT2                     | 0.567 | 0.025  | 1.762   |
| ENVATT3                     | 0.751 | 0.001  | 2.119   |
| Reference: MOTIVE1          | 1.250 | 0.000  | 3.490   |
| MOTIVE2                     | 1.585 | 0.000  | 4.880   |
| MOTIVE3                     | 0.003 | 0.000  | 0.997   |
| BID                         | −0.822| 0.001  | 0.440   |
| Reference: INCOME3          | −0.877| 0.000  | 0.416   |
| INCOME1                     | 1.341 | 0.000  | 3.822   |
| INCOME2                     | −0.589| 0.004  | 0.555   |
| VERSION                     | −1.675| 0.000  | 0.187   |

Hosmer–Lemeshow test 0.804, 76.3% predicted correct, log likelihood: −347.26, n=710.
resource, it is not crucial what the motives are exactly. The result also supports the previous finding about the similarity of users and non-users.

Environmental and general conservation attitudes also have a strong impact on supporting probability. The odds for accepting the bid for respondents who considered environmental issues important were more than twice that of respondents emphasizing economic issues. Similarly, the odds for respondents considering nature conservation in general as very necessary were twice that of other respondents. Thus, pre-judgements of the issue in general and general attitudes seem to play important part in decision-making.

The odds for accepting the bids for respondents to a citizen version were 3.8 times that of the consumer version. This strongly suggests that the framing of the valuation question has an influence on the types of preferences that will be revealed. The impact of the framing of the WTP question is discussed in more detail elsewhere (Ovaskainen and Knivîlå, 2005). In line with standard expectations, the variables BID and INCOME significantly explained in this model support probability. An increase of the proposed bid decreases the probability to accept it. Respondents belonging to the highest income group were more likely to accept the proposed bid than other income groups, but there was no difference between low and medium income groups.

4.4. The impact of use on the validity of the responses

Validity refers to correspondence between what one wishes to measure and what was actually measured. In this study, we examine the construct validity of responses, i.e. how well willingness to pay is predicted by the factors that are expected to be predictive a priori (e.g. Freeman, 1993; Carson et al., 2001).

The price of the good and the respondent’s income are factors which should significantly impact upon the willingness to pay responses and which thus are important indicators of the validity. According to standard economic theory, an increase in the price of the good should decrease demand, whereas an increase in income should have the opposite impact. In addition, a reasonable change in the scenario, e.g. an increase in the amount of the good to be valued, as well as the respondents’ general attitudes, should also have a consistent impact (e.g. Freeman, 1993). Normally, respondents that have positive environmental attitudes are expected to be willing to pay more than non-environmentalists (Carson et al., 2001, see also e.g. Kotchen and Reiling, 2000). On the other hand, significance of general environmental attitudes may also raise questions of symbolic responses. In particular, if respondents do not have any previous experience of the resource, they have to base their decisions not only on the information given in the survey, but to a large extent, also on the general consideration of the importance of nature conservation in general. In this case, it is not obvious if the respondents are actually assessing the value of the specific resource or more generally the desirability of conservation.

As the results of the previous chapter (Table 6) showed, the respondents’ responses in this study seem to be consistent with economic theory and can be considered to be valid when the whole data is considered. The same model for the pooled data with slight modifications is presented in Table 7. However, the model does not, as such, include any information about validity differences between non-users’ and users’ responses and, therefore, further analyses using a group dummy variable with interaction terms, separate models for users and non-users, and heteroscedasticity tests were carried out. Likelihood ratio tests were also used to assess the similarity of the valuation processes of the groups.

Independent variables for the models (Table 7) are the same as in Table 6, except for the variable FUTURE VISITOR, which has a value of 1, if the respondent aims at visiting a conservation area in the near future, 0 for otherwise. Both users and non-users seem to take into consideration the proposed bid in an expected way — the higher the bid the less likely the respondents were to accept it. Still, even if BID significantly explained probability to support conservation, the actual impact was low in both groups. However, most interestingly, no significant difference was found between any of the non-users’ income groups in the probability to support conservation. In addition, in the group of users only the highest income group differed in this model from other groups, but there was no difference between low and medium income groups. Environmental attitudes significantly affected the probability to accept the proposed bid in both groups, which indicates that even if the respondent knows the valued good well beforehand, attitudes about the subject in general (e.g. of nature conservation) are always part of the decision-making process. Similarly, the questionnaire version also influenced the responses of both groups.

Even if income was a more significant explanatory variable in the users’ group than in the non-users’ group a more detailed analysis using pooled data and a group dummy with interaction terms showed that there is no statistically significant difference between the groups in their consideration of income constraints. Similarly, no difference was found between users and non-users in the impact of the proposed bid on their willingness to support sustained conservation.

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7 As no difference was found between the two citizen versions in supporting probability, these versions are combined in this model. When versions were not combined in the model, they differed at the 20% risk level. To examine if the questionnaire version had a different impact on the responses of users and non-users, interaction terms were used. No differences were found. Similarly, there were no differences in the impact of the questionnaire version on respondents planning to visit in the area and those who did not have those intentions. Also, separate models estimated for the consumer version and the two citizen versions combined indicated no major differences in the results. However, in the group who received the consumer version, the impact of intended use was more vague than in the whole data.

8 Respondents were divided to income groups, which included 26.3%, 31.0% and 42.7% of respondents, respectively (non-users: 33.2%, 30.4% and 36.4%, users: 22%, 31.3% and 46.7%).
Furthermore, there was no difference in the impact of general environmental or conservation attitudes, future visit, motives, received questionnaire version or age. In addition, a heteroscedasticity test which tested variance of unobserved factors in the users’ group relative to that in the non-users’ group indicated that there is no difference between groups in choice consistency. Thus, the results of the analyses do not support the hypothesis that non-users’ responses would be less valid than users’ responses. Furthermore, a test of the equivalence of parameter vectors between the two groups (i.e. not validity of responses) indicated that there are no differences between the two groups in the valuation process (LR-test, $\chi^2=7.54$, df=12, critical value 18.55 at the 0.1 level).

### 5. Discussion and conclusions

In this study, the main aim was to examine the differences between users and non-users of nature conservation areas. The differences in the probability of supporting conservation, validity of WTP responses, motives for valuing conservation and socio-economic factors were examined.

On-site use is one of the ways to gain familiarity with the resource. It can also be considered to be one of the most effective ways to understand a resource’s relative importance, in particular if the respondent also has previous knowledge of other resources. The impact of experience gained by seeing the resource is often strengthened by the additional information provided at the site. Non-users, on the other hand, are evidently lacking in personal experience of the resource, and they may also discover its existence for the first time from the survey. Thus, the users may be considered to have a significantly different and better basis for the valuation process.

Users of the studied conservation areas were likely to be men, local and older than non-users, all these being factors which generally have a negative effect on willingness to pay. However, they also had better knowledge of nature conservation in general and a higher interest in nature related information, which may be considered to increase the validity of the responses. However, when examined in more detail, no drastic difference in validity of responses was found between the two groups, even if non-users were somewhat less disposed than users to consider their budget constraints. This result differs, to some extent, from several previous studies, which concluded that validity of responses clearly increases with experience. This study also supports the general conception that non-use values are the major motives for valuing environmental assets like conservation areas. Non-use values were important also for users, even if the use of the resource was intensive, and in general, use values had minor importance.

Similarity between the two groups further stresses the fact that previous use of the resource did not increase the respondents’ willingness to support continued conservation. This differs from previous studies, which found evidence that experience increases WTP (e.g. Cameron and Englin, 1997). However, respondents who aimed at visiting some of the areas in the near future were significantly more willing to support continued conservation than other respondents. This result is in line, e.g., with the study of Stevens et al. (1991). Selfish motives seem to have

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### Table 7 – Logistic regression model for support of sustained conservation, the whole data, non-users and users

<table>
<thead>
<tr>
<th></th>
<th>Pooled data</th>
<th></th>
<th>Non-users</th>
<th></th>
<th>Users</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BID</td>
<td>$-0.003$</td>
<td>$0.000$</td>
<td>$-0.003$</td>
<td>$0.000$</td>
<td>$0.997$</td>
<td>$-0.003$</td>
</tr>
<tr>
<td>Reference: INCOME1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INCOME2</td>
<td>$-0.071$</td>
<td>$0.787$</td>
<td>$0.140$</td>
<td>$0.746$</td>
<td>$1.151$</td>
<td>$-0.119$</td>
</tr>
<tr>
<td>INCOME3</td>
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<td>$0.001$</td>
<td>$0.552$</td>
<td>$0.193$</td>
<td>$1.736$</td>
<td>$0.948$</td>
</tr>
<tr>
<td>VERSION</td>
<td>$1.342$</td>
<td>$0.000$</td>
<td>$1.193$</td>
<td>$0.001$</td>
<td>$3.296$</td>
<td>$1.450$</td>
</tr>
<tr>
<td>FUTURE VISITOR</td>
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<td>$0.000$</td>
<td>$1.137$</td>
<td>$0.005$</td>
<td>$3.118$</td>
<td>$0.659$</td>
</tr>
<tr>
<td>AGE</td>
<td>$-0.603$</td>
<td>$0.003$</td>
<td>$-0.818$</td>
<td>$0.040$</td>
<td>$0.442$</td>
<td>$-0.517$</td>
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<tr>
<td>Reference: ENVATT1</td>
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<tr>
<td>ENVATT2</td>
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<td>$0.040$</td>
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<td>$0.412$</td>
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<tr>
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<td>$0.010$</td>
<td>$3.063$</td>
<td>$0.625$</td>
</tr>
<tr>
<td>Reference: MOTIVE1</td>
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<tr>
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<td>$1.376$</td>
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<tr>
<td>MOTIVE3</td>
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<tr>
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<td>$-2.606$</td>
<td>$0.000$</td>
<td>$0.074$</td>
<td>$-2.505$</td>
</tr>
</tbody>
</table>

Model for pooled data: $n=710$, log likelihood: $-347.67$, Hosmer–Lemeshow test: 0.732, percentage predicted correct 75.8.
Model for non-users: $n=246$, log likelihood: $-109.96$, Hosmer–Lemeshow test: 0.906, percentage predicted correct 78.0.
Model for users: $n=464$, log likelihood: $-233.94$, Hosmer–Lemeshow test: 0.238, percentage predicted correct 75.6.
importance in relation to WTP, even if the option value was not generally considered to be amongst the most important motives for valuing the resource.

It is important to notice, however, that in this study separation was not done between non-users who were familiar with the areas beforehand and other non-users. Existing (off-site use) knowledge may to some extent explain the similarity of the replies of the users’ and non-users’ groups in this study. However, existing knowledge is also likely to decrease respondents’ uncertainty that can in some cases cause validity problems and have significant impacts on mean WTP. Similarity in protest behavior and non-response further indicates that uncertainty is not likely to be a problem, even if questions on that or explicit measures of belief completeness or coherence (see e.g. Crocker et al., 1998) were not incorporated in the survey.

According to the results of this survey there is no rationale on validity grounds to restrict CVM analysis to cover only individuals that have prior experience of the resource. This is in line with the basic premise of CVM. Exclusion of non-users would lead to significant underestimation of the benefits of conservation. On the other hand, if exclusion of non-users is not evidently enough as non-resource. This is in line with the basic premise of CVM.

Exclusion of non-users would lead to significant underestimation of the benefits of conservation. On the other hand, if non-use values, as such, are seen as problematic, because of double-counting, ethical considerations or some other reasons, exclusion of non-users is not evidently enough as non-use values also seem to be very important for more experienced respondents. The rationale for using CVM for valuation of non-market benefits would, then, be considerably challenged.

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REFERENCES

