



## Special article

# Forest management or greed of gain?—An information experiment on peri-urban forest visitors' attitudes regarding harvesting operations



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## 1. Introduction

Research on the perception of urban and peri-urban forests has a strong tradition (cf. Schroeder, 1990). Understanding relationships between urban populations and forest ecosystems is considered necessary for balanced natural resource management. Previous research focused on city dwellers' attitudes towards the management of urban forests and other green spaces (cf. Baur et al., 2016), their preferences with respect to site characteristics, e.g. when seeking relaxation (cf. Arnberger and Eder, 2015), and individual perceptions and use of space (cf. Ode Sang et al., 2016).

Schmithüsen and Wild-Eck, (2000) showed that the urban public perceives forests predominantly in terms of their recreational and environmental functions. In Central Europe, with predominantly seminatural forests used for both forestry and recreation, a certain degree of management is necessary in order to establish a suitable level of balance between these two functions. Tahvanainen et al. (2001) showed that visual aspects are more relevant in perception formation than verbal information.

Consumer attitudes towards wood-based products have also been the subject of research. Especially in connection with building materials (cf. Roos and Hugosson, 2008; Jonsson, 2005) and furniture (cf. Brinberg et al., 2007; Ridoutt et al., 2002), perceptions relating to wood tend to be quite positive. However, such positive perceptions stand in stark contrast to perceptions relating to wood harvesting operations (cf. Bliss, 2000). This phenomenon, a positive perception of a product together with a negative attitude towards the associated, necessary production process, is actually quite widespread, and could be referred to as the 'slaughter house paradox' (cf. Pauli et al., 1998).

In general, a lack of personal knowledge and experience regarding underlying processes can be expected to increase the difference between the negative and the positive perceptions associated with various elements of a supply chain, like for example in agricultural production (cf. Helmle, 2010). Ranacher and Stern (2016) showed that personal involvement in the forest based sector influences a person's perception of forest management. Similarly, there is also a strong relationship between individual preferences with respect to forest scenes and

attitudes towards forest management (cf. Kearney, 2011).

The aim of the present study was thus to explore how peri-urban forest visitors' attitudes are affected by the provision of public information boards in the relatively emotional setting of a timber harvesting site and whether such boards are a suitable tool for raising public acceptance of forest management practices (practices that normally act to undermine the attraction of a forest setting).

## 2. Material & method

According to Fishbein and Ajzen (1975) "an attitude represents a person's general feeling of favourableness or unfavourableness toward some stimulus object". In the present study, attributes and values are used to express people's attitudes by means of a hierarchical value map (cf. Gengler et al., 1995). Previous studies (cf. López-Mosquera and Sánchez, 2011; López-Mosquera and Sánchez, 2013) used means-end chain techniques to examine how visitors of peri-urban green areas reflect upon their own personal values through the benefits and attributes they perceive in the natural areas.

Thus, we wanted to explore the range of attitudes among recreational forest visitors regarding forest management in a peri-urban forest. Additionally, we sought to examine how targeted information can influence the attributes and values mentioned by the forest visitors towards forest management. First, the survey tool itself was created in a preparatory study. Thereafter, the tool was applied in order to survey visitors passing by a harvesting site in the Vienna Woods.

### 2.1. Preparatory study

As the aim of the study is to measure attitudes towards harvesting operations and not towards a product, the means-end concept (cf. Liebel, 2007) was adapted to suit this purpose. The means-end theory assumes that the characteristics of a product (1st level), the consequences of using a product (2nd level), and personal values (3rd level), all influence consumer behaviour (cf. Liebel, 2007). In the present context the subdivision of properties into attributes (1st level) and consequences (2nd level) seemed arbitrary and not particularly useful.

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This can be demonstrated with the example of “construction timber” Should the latter be viewed as an attribute or as a consequence of log harvesting?” Thus, in order to avoid unnecessary complications, instead of dividing properties into attributes and consequences, they were both summarised as attributes.

Twelve participants were selected by convenience sampling. The selection criterion employed was participants’ admission that they occasionally visit nearby forests for recreational purposes. They were asked, in a relaxed environment, what they think of and how they feel when encountering a harvesting site during their forest visits. Their attitudes on harvesting operations were collected using the laddering method. After responses were given, the interviewer then asked, in an iterative manner, response questions such as “Why is this important to you?”, in order to identify the specific attributes and values underlying the attitudes. The purpose here was to develop a preliminary hierarchical value map for the data collection in the field.

## 2.2. Experimental design of the survey

To measure the effect of information provided at the harvesting site, we applied an experimental research design. The experiment was carried out in a peri-urban forest, the biosphere reserve in the Vienna Woods (German: “Biosphärenpark Wienerwald”). It has a total size of 1056 km<sup>2</sup> and covers parts of Vienna and Lower Austria. One third of the forest is state-owned and managed by the Austrian Federal Forests. As are the majority of Austrian forests, it is a semi-natural forest. The dominating tree species is beech. Oak, fir, spruce, larch, black pine, red pine and hornbeam, occur in smaller percentages. It is a forest used for sustainable forest management and recreation and also provides a habitat for flora and fauna. Within the total area of the biosphere reserve there are 37 nature conservation areas that are not subject to forest management. As a result, it is assumed that forest visitors do not expect this part of the forest to be a commercial area and thus subject to harvest.

The experiment took place next to a one hectare area where an old beech stand had been removed. The purpose of the harvest was to aid natural rejuvenation. The removed beech stand is located in the district of Mödling, close to the Anningerhaus, a popular restaurant among forest visitors in this area.

During the harvesting operations, which took six weeks, the trail next to the harvest area was closed, thus making the area inaccessible to forest visitors. Immediately after harvest completion the trail was reopened and three information boards were placed next to the removed beech stand. The boards were only installed for a few hours a day while the experiment was conducted.

Since the present study focused on the conflict between forest use and forest conservation, and how this conflict might be reduced, the three information boards were designed to support forest management measures. The purpose was to investigate whether the information boards provided had an impact on forest visitors’ perception. The boards contained information on forest management, its impacts, and on wood use (see Appendix). The content used on the information boards was devised on the basis of previous studies which had revealed the extent of public concern in Austria regarding forestry (Ranacher and Stern, 2016; Luggauer, 2016). The information boards were developed by the present authors in cooperation with the Austrian Federal Forests.

Due to the novelty of the research design and the content used on the information boards, the application of a qualitative-exploratory primary research design (cf. Barton and Lazarsfeld, 1984) seemed appropriate. A semi-standardized questionnaire was thus applied in a guided interview, using the method of soft laddering (cf. Costa et al.,

2004) to measure the effect of the info boards on people’s perceptions. Owing to the relatively time-consuming and strenuous character of the technique, a shortened form of the laddering questioning, with minimum loss of information was desirable (cf. Kaciak et al., 2010). For this reason, the hierarchical value map (HVM) developed in the preparatory study was employed to train the interviewer and thus ensure that the survey could be carried out as smoothly as possible for all concerned.

In order to measure the effect of the information boards on perceptions, the survey was divided into various periods, i.e. periods, where the information boards were employed (Sign Readers), and survey periods where, in order to obtain a reference group, they were removed (Sign Non-Readers). There is, of course, an additional group, i.e. those who were exposed to the boards but chose to ignore the information posted (Sign Ignorers), and these people must also be taken into account. To control for external influences, the information boards were set up alternatively in the morning or in the afternoon. Additionally, the information boards were placed beside the path. To ensure that the forest visitors read the information boards out of their own self-interest and in accordance with their own wishes, interviewers remained out of sight. Every visitor passing by older than 15 years was asked to participate. 90% of those asked agreed to take part in the survey.

After providing the participants with the necessary background information (the purpose of the survey, the investigating institution, the assurance that the information would be treated anonymously, etc.) the questioning proceeded with the aid of the semi-standardized questionnaire. The first question asked focused on perceptions relating to the harvesting area and the information boards (in the case of Sign Readers and Sign Ignorers). The attitudes of the forest visitors were identified by measuring attributes and values using the laddering method. The participants were asked: “What do you think of this harvesting measure? Why has it been done? Why do you attach importance to [named properties]?” Employing the HVM from the preparatory study meant that the laddering approach could be carried out as quickly as possible. The last part of the survey addressed the frequency of forest walks in the Vienna Woods, as well as relevant sociodemographic data. Furthermore, the survey participants were asked whether they had any connection to the forestry sector or forestry activity, e.g. via education, ownership, or occupation since it was assumed that this would have an influence on perceptions relating to the economic use of forests (Ranacher and Stern, 2016).

The laddering component was analysed quantitatively by counting the frequency of each item mentioned. As a result, a second, final HVM was created, which enables the results to be shown in a much clearer arrangement. Subsequent to this, linkages between the items identified were set out in an implication matrix (cf. Reynolds and Gutman, 1988; Liebel, 2007). Furthermore, chains of relations, outlining relatively frequent linkages, were developed from the implication matrix (cf. Reynolds and Gutman, 1988). As it was not useful to distinguish between direct and indirect linkages, the chains of relations (so called attitude chains) could thus be presented in a more reader-friendly manner (see Fig. 2).

## 3. Results

### 3.1. Hierarchical value map

The explorative, qualitative, preparatory study enabled a preliminary HVM to be created via the condensing of participant responses which were similar. The HVM serves as the foundation for the survey in

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