

Experimental Long-Term Evaluation of Measures to Reduce Biker-Hiker Conflicts – an Example of an Urban Forest in Switzerland

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Introduction

Intensity and diversity of leisure activities in outdoor areas have increased considerably in Western societies. Because of this growing use of natural resources and the variety of motives and aims of leisure activities, ecological impacts and social conflicts may arise in outdoor recreation. Since forests are often the only open spaces available for outdoor recreation – especially in densely populated areas –, this issue is particularly accentuated in urban forests. Accordingly, urban forests are often the subject of conflict studies (Schmithüsen and Wild-Eck 2000; Seeland et al. 2002; Janowsky and Becker 2003; Hegetschweiler et al. 2007).

A distinct example for the conflict potential of leisure activities is biking in forests. Studies have shown that conflicts between bikers and hikers are reported frequently (e.g. Hunziker et al. 2012; Rupf et al. 2014; Wyttenbach and Rupf 2014; Pickering and Rossi 2016), in particular in urban forests. This also happened in the forest at the Uetliberg mountain close to Zurich, where until 2005 hikers and mountain bikers were increasingly getting in each other's way.

As a measure to deal with the conflict, the City of Zürich 2005 built a bike trail to keep the bikers on a separate route. In addition, an accompanying information campaign was launched, and the transport of bikes on the train up to the Uetliberg mountain, where the trail starts, was banned.

The aim of our study was to evaluate these management measures. To reach this aim, the following research questions had to be answered:

1. How was the *acceptance* of the management measures (trail, communication, bike-transport ban) taken by the authorities?
2. What was the actual *effect* (short and long-term) of the management measures regarding resolution of conflicts between hikers and bikers?

Methods

To answer research question 1, the conduction of a survey after the implementation of the management measures would have sufficed. To answer research question 2, an experimental design had to be applied. Therefore, three surveys were conducted: a first one 2005 before the implementation of the management measures, a second one 2006, more than one year after the implementation, and a third one 2017, 11 years after implementation.

During survey 1, 1000 highly standardised questionnaires were handed out at several locations and at several representative weekdays on the Uetliberg mountain to visitors (bikers and hikers) who returned the questionnaire by post (N= 507). For the second survey, we sent

the questionnaire (consisting of the same questions regarding perceived conflicts but also including questions regarding acceptance of management measures) to the participants of survey 1 (if the address was provided). 317 participants returned the questionnaire in this round. The distribution of the questionnaires of third survey 2017 was conducted again on-site, as it was not possible to contact the same people from the first two rounds again after such a long time. 499 participants returned a completed questionnaire by post.

The data were analysed by means of the statistics package SPSS including descriptive measures, factor analyses to reduce data complexity, cluster analyses to explore specific visitor groups and multi-variate models with respective tests such as ANOVA, F-Tests, t-tests, etc. The latter procedures served to examine the significance of differences and effects allowing to evaluate the success of the measures taken.

Results

The results show that the management measures helped to defuse the conflicts between the hikers and the bikers already after a short period (2005-2006) and even more after a long period of time (2005/6-2011). Regarding research question 1, the measures taken were highly accepted 2006 and have been continued to be viewed positively 2017. Only the ban on transporting bikes on the Uetliberg by train was rated 2017 significantly worse than in 2006. Regarding research question 2, also clear positive effects on (perceived) conflicts between hikers and bikers can be observed: being disturbed by bikers was mentioned significantly less frequently 2006 than 2005, and again less frequently 2017 (Fig. 1) even though more of them were using the forest. The impressive reduction of perceived conflicts consequently resulted in an increasing satisfaction of the visitors at Uetliberg forest with their stay.

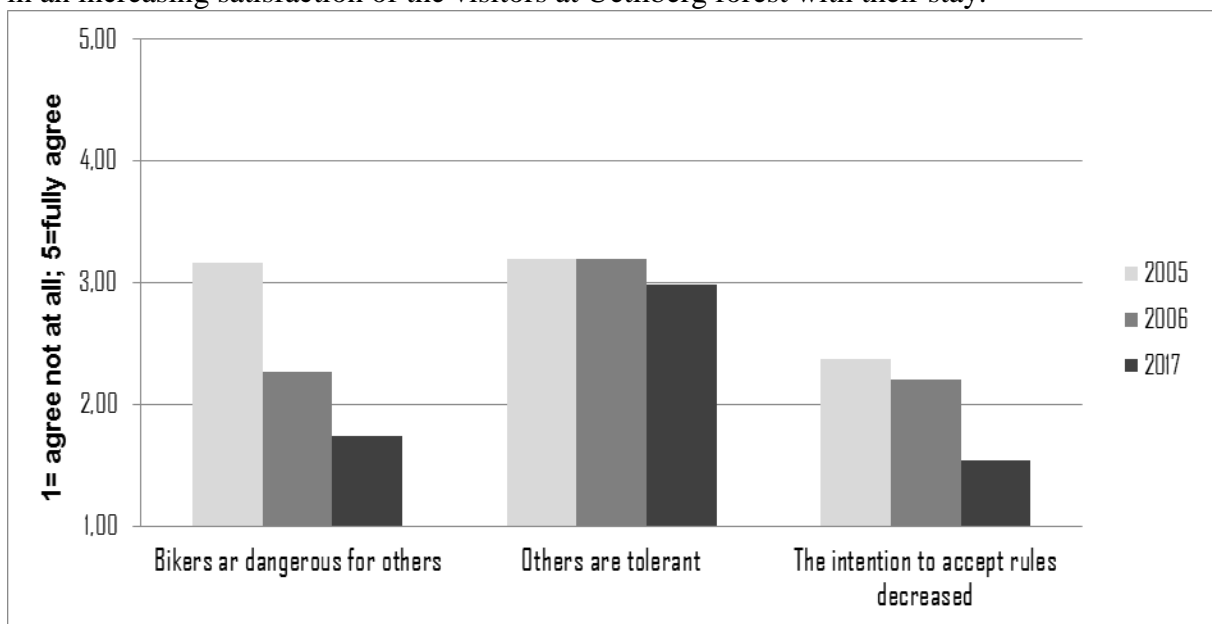


Figure 1: Level of agreement to the Likert-scale items serving to measure the degree of perceived conflicts between bikers and hikers. Differences between 2017 and 2006 were all highly significant (ANOVA post hoc test: $p \leq .001$) whereas only the perceived dangerousness was significantly reduced from 2005 to 2006.

Discussion

Despite the reduction of conflicts and resulting gain of visitations satisfaction caused by the management measures taken, the development at Uetliberg is not only a success story that increases happiness of all people involved. In particular, the (rather young) downhill bikers

could not be included into the survey because the bike-transport ban has led to them no longer visiting the Uetliberg. Thus, the high overall satisfaction of the visitors with the situation on the Uetliberg could also be biased by the lack of responses from downhill bikers. Nevertheless, the evaluation has shown that the measures taken have been successful and that such measures can be recommended to other areas where biking and hiking highly compete in using the existing infrastructure.

References

- Hegetschweiler, K. T., H. P. Rusterholz, and B. Baur. 2007. Fire place preferences of forest visitors in northwestern Switzerland: Implications for the management of picnic sites. *Urban Forestry & Urban Greening* **6**:73-81.
- Hunziker, M., Frick, J., von Lindern, E., and Bauer, N, 2012. Das Verhältnis der Schweizer Bevölkerung zum Wald – Waldmonitoring soziokulturell: Weiterentwicklung und zweite Erhebung – WaMos 2. Birmensdorf, Eidg. Forschungsanstalt WSL. 180 S.
- Janowsky, D., and G. Becker. 2003. Characteristics and needs of different user groups in the urban forest of Stuttgart. *Journal for Nature Conservation* **11**:251-259.
- Pickering, C. M., and S. Rossi. 2016. Mountain biking in peri-urban parks: Social factors influencing perceptions of conflicts in three popular National Parks in Australia. *Journal of Outdoor Recreation and Tourism-Research Planning and Management* **15**:71-81.
- Rupf, R., W. Haider, and U. Pröbstl. 2014. Hikers and mountain bikers—do they fight like cats and dogs. Pages 253-255 in *Proceedings of the 7th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas*.
- Schmithüsen, F., and S. Wild-Eck. 2000. Uses and perceptions of forests by people living in urban areas - findings from selected empirical studies. *Forstwissenschaftliches Centralblatt* **119**:395-408.
- Seeland, K., K. Moser, H. Scheuthle, and F. G. Kaiser. 2002. Public acceptance of restrictions imposed on recreational activities in the peri-urban Nature Reserve Sihlwald, Switzerland. *Urban Forestry & Urban Greening* **1**:49-57.
- Wytenbach, M., and R. Rupf. 2014. Urban mountain biking—multiple-uses of trails on the Uetliberg in Zurich, Switzerland. Pages 244-246 in *The 7th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas, Local Community and Outdoor Recreation*. Tallinn University Tallinn.