



# Improving mountain bike trails in Austria: An assessment of trail preferences and benefits from trail features using choice experiments



Dieter B.A. Koemle\*, Ulrich B. Morawetz

University of Natural Resources and Life Sciences Vienna, Feistmantelstraße 4, 1180 Vienna, Austria

## ARTICLE INFO

### Article history:

Received 22 May 2014

Received in revised form

5 April 2016

Accepted 7 April 2016

### Keywords:

Choice experiment

Valuation method

Outdoor recreation

Mountain biking

Trail design

Austria

## ABSTRACT

Over the past two decades, mountain biking has emerged as an increasingly popular recreational activity. However, at least in Austria official trails do not necessarily match the preferences of bikers and therefore they often ride on unofficial trails or on trails where biking is not allowed. This behavior can result in conflicts with other trail users, landowners, hunters and conservationists. With data from an online choice experiment we confirm and extend results from previous studies on mountain biking, such as riders preferring technically challenging trails with lots of singletrack and vertical climb. However, the specific preferences depend on rider characteristics, especially experience and age. Through a simulation of market shares and the calculation of compensating surplus for riders in the study area in forests close to Vienna, we demonstrate how this research can provide insights about how to adjust trails to better match the interests of bikers while still respecting regulations which are in the interests of landowners, hunters and ecological concerns.

## MANAGEMENT IMPLICATIONS

- To avoid conflict with other trail users, we propose tailoring trails specifically to the needs of the diverse group of bikers.
- For example, trails should have large amounts of technically challenging singletrack, at least on down hill sections.
- Trails should vary in their attributes such as vertical climb or length, to fit the preferences of riders with different socio-demographic background and experience.
- Multi-use trails for bikers and hikers can be recommended, however, horses on the same trails should be avoided.

© 2016 Elsevier Ltd. All rights reserved.

## 1. Introduction

Mountain biking is an increasingly popular recreational activity worldwide. Technological advances have made riding easier and more comfortable, and fierce competition between established bike retailers and newer on-line sellers have made riding a quality bike affordable for many consumers. Annual bike sales in Austria have increased from 142,000 in 2007 to 155,000 in 2009 (Beckendorff, 2010). Furthermore, the market has quickly differentiated

into different riding styles such as down-hill biking, tour and cross-country riding, competition style riding types such as free-riding or four-cross, among others (Quinn, & Chernoff, 2010). While mountain biking in Austria is exempt from the general free access to forests (Forstgesetz, 1975), the Austrian Federal Forests have responded to the rising demand for mountain bike trails by opening around 2100 km of logging roads to mountain bike use (Bundesforste AG, 2013).

Along with the rapid rise of mountain biking there has also been an increase in associated problems. Of particular concern are riders going off designated trails. Concerns of resource managers include the safety of all trail users, user conflicts, crowding, and environmental degradation (White, Waskey, Brodehl, & Foti, 2006). This paper tries to assess the trail preferences of mountain bikers to better understand why bikers choose to leave designated

\* Corresponding author. Present/permanent address: Georg-August-University of Göttingen, Department for Agricultural Economics and Rural Development, Platz der Goettinger Sieben 5, 37073 Göttingen, Germany.

E-mail addresses: [dkoemle@gwdg.de](mailto:dkoemle@gwdg.de) (D.B.A. Koemle), [ulrich.morawetz@boku.ac.at](mailto:ulrich.morawetz@boku.ac.at) (U.B. Morawetz).

trails, and to be able to design policies that prevent them from doing so.

Environmental concerns include the degradation of soil, vegetation, and disturbance of wildlife (see e.g. Pickering, Hill, Newsome, and Leung (2010) for a literature review for the USA and Australia). Degradation of soil and vegetation can be similar between hikers and bikers, as several studies have found. For example, Thurston, and Reader (2001) report no significant differences between the impacts of hikers and bikers on soil and vegetation in an experimental setting. Pickering, and Barros (2015) and Pickering, Rossi, and Barros (2011) point out, however, that ecological impacts of hiking and mountain biking are only similar at low levels of use, while mountain bikers may have a more severe impact on vegetation if use levels increase. Trail widening due to mountain biking might be particularly pronounced in wet spots (Goefl, & Alder, 2001; White et al., 2006). Soil degradation specifically attributable to mountain bikers can also occur along steep slopes due to spinning tires when going uphill or poor braking technique (skidding) when going downhill. These problems are compounded by the fact that many bikers prefer technically challenging trails with steep slopes and obstacles (Cessford, 1995; Goefl, & Alder, 2001; Hollenhorst, Schuett, & Olson, 1994; Siderelis, Naber, & Leung, 2010), and might even seek these challenges on informal (social) trails, where the ecological impacts can be more severe (Havlick, Billmeyer, Huber, Vogt, & Rodman, 2016). Impacts on wildlife have been reported by Marzano, and Dandy (2012) in two broad categories: (1) flight behavior change, and (2) habitat change through trampling and erosion. Overall, the empirical evidence suggests that animal flight behavior does not differ dramatically between mountain bikers and hikers (Naylor, Wisdom, & Anthony, 2009; Taylor, & Knight, 2003). Also, as Lathrop (2003) points out, bikers might be less likely to go off trail and therefore cause damage by trampling, since trails provide an ideal surface for most mountain bikers.

A broad literature exists on the conflict between different user groups in recreation (e.g. Carothers, & Vaske, 2001; Cessford, 2003; Hoger, & Chavez, 1998; Jacob, & Schreyer, 1980; Jacoby, 1990; Ramthun, 1995; Watson, 2001; Watson, Williams, & Daigle, 1991). Management approaches to tackle conflict include zoning or trail designation for different user groups, or education of these user groups about behavior on shared trails (e.g. “trail rules”) (Carothers and Vaske, 2001). However, both approaches require trail users to respect the implemented management strategies, i.e. to respect zoning laws, or to adhere to the rules proposed to facilitate the common use of the trails. While inconsistent evidence has been reported on conflict between hikers and mountain bikers, some common denominators can be extracted from the literature. First, hikers and mountain bikers seem to perceive conflict differently, with hikers feeling their experience to be more negatively affected than the other way round (Jacoby, 1990 as cited by Hoger, & Chavez, 1998). Second, hikers may perceive safety issues due to the speed and quiet approach of mountain bikers (Chavez, Winter, & Baas, 1993; Watson et al., 1991). However, findings by Cessford (2003) indicate that perception of bikers by hikers can be largely positive, in particular among younger hikers, and the presence of bikers does not seem to detract from the overall hiking experience significantly. Finally, Chavez (1996) also reports safety concerns of horseback riders, with horseback communities engaging in organized protest against the use of “their” trails by mountain bikers.

A number of management issues with mountain bikers have also been observed in Austrian forests. For example, the integrated management of wildlife, recreation and commercial forestry in the Wienerwald forest did not receive wide acceptance by mountain bikers (Reimoser et al., 2008). Stoeckl (2010) found that riders tend to leave the designated trails, which are mostly routed along logging roads, for more technically challenging singletrack.

Although most riders' knowledge of spatial and temporal riding restrictions was very good, many were reluctant to respect them. Reasons for going off trail included curiosity, looking for variety and more interesting trails, a lack of mountain bike trails or connections between designated trails, and to avoid crowded trails (Brandenburg, & Ziener, 2007). Brandenburg, and Ziener (2007) also mention that the interests of land owners and hunters were weighted more heavily over the interests of mountain bikers, when a new management plan was negotiated. Therefore they recommended a re-assessment of existing trails and a widening of the current trail system, while considering the preferences of various types of mountain bikers.

While the mountain-biking community is very diverse, we limited our investigation to the cross-country and touring community. These bikers prefer a variety of trails including uphill, flat, and downhill sections and levels of difficulty from easy dirt roads to rocky/technical terrain (Quinn and Chernoff, 2010). Therefore they use a wide variety of legal and illegal trails, which increases the potential for conflict with other users on trails. The goal of this research paper is two-fold: first, we assess preferred trail features of various subgroups of mountain bike riders (i.e. riders of different age, sex, and experience) and compare our findings with those from the international literature. Second, we will try to quantify these subgroups' trail preferences in order to estimate the benefits they derive from important trail features in terms of market share changes due to trail changes, and the resulting compensating surplus. These findings may help managers to design trails to reflect biker preferences and possibly reduce the necessity of measures to manage user conflicts and environmental degradation.

We proceed as follows: Section 2 outlines the theoretical background and methodological approach we took in experimental design and analysis. Section 3 summarizes the results of the experiment and demonstrates a practical approach for their use in exploring management issues. Finally, we discuss our findings and formulate some policy recommendations in Section 4.

## 2. Method

Several methods for the elicitation of preferences have been documented in the literature. A convenient conceptual framework is provided by the economic theory of utility maximization. In short, individuals are expected to make choices to maximize their satisfaction (utility). With recorded purchases of market goods, these choices are usually easy to observe and utility functions can be estimated using econometric methods. However, due to the free access to mountain bike trails in most locations, including Austria, they exhibit many of the features commonly recognized as non-market goods, including the non-excludability and non-rivalry (up to a point) (Just, Hueth, & Schmitz, 2004). These features make market observations challenging, and different methods of value elicitation must be used. In the field of non-market valuation methods, revealed preference (RP) and stated preference (SP) methods can be distinguished. Revealed preference methods usually include market observations, whose use is associated with some aspect of a non-market good (e.g. weak complementarity). An example in the context of mountain biking is the travel cost method applied by Fix, and Loomis (1997), in which mountain bike trails are valued by the amount of money people are willing to spend to get to a certain trail. Stated preference methods usually include an elicitation of preferences via hypothetical surveys; the most common among them are the contingent valuation method (CVM) and choice experiments (CE). The strengths of the CVM lie in the valuation of an entire good which is conceptually difficult to disentangle. Choice experiments, by the assumption of an additive utility specification proposed by Lancaster (1966), are the most

Download English Version:

<https://daneshyari.com/en/article/4759867>

Download Persian Version:

<https://daneshyari.com/article/4759867>

[Daneshyari.com](https://daneshyari.com)