

Assessing User Conflicts in an Urban Forest by Long-Term Video Monitoring

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Introduction

Urban forests suffer from intense use and multi-use activities by fast and slow moving visitors such as bicyclists, joggers and walkers and are affected by inappropriate visitor behaviours such as releasing the dog from the leash. Therefore, user conflicts might be very likely to occur, in particular at heavily used main access points. Information about the kind and amount of user conflicts occurring during the year would assist area administration in forest management.

Methods

Long-term data on user conflicts were collected in an inner urban forest, which is situated in the south of Vienna, Austria. The inner urban forest of 120 hectares provides about 14 km of forest roads, gravel trails and many footpaths. Cycling is permitted only on two trails, and dogs are allowed, but must remain on a leash.

Video monitoring was undertaken at three main multi-use access points over a period of one entire year (2002-2003), daily from dawn to dusk (Arnberger 2006). Each monitoring unit consisted of a weatherproof black-and-white video camera and a time-lapse video recorder. In order to avoid vandalism and to allow for unobstructed observations, the cameras were hidden in nesting boxes. The cameras were installed on wood-poles about four meters above ground, or on roofs of buildings. The time-lapse video recorders captured single images at fixed intervals of 1.6 seconds over the entire day. With the type of video camera installed and

its specific setting, it was impossible to identify individuals in the video images, ensuring anonymity of the subjects. To reduce analysing costs, only 20 minutes of observations per each hour of the year were taken into account. The tapes were viewed on a television monitor by trained students. The following data were captured from the video tapes: location, date and time of conflict, kind of conflict and activity type involved, and users' reactions to conflict. In addition, on-site interviews with 952 visitors were conducted at access points on ten days.

Results

During the year of observation, 284 user conflicts were recorded. This is a very small number, compared to 239.000 visitors registered at the three access points. About half of the conflicts were taped on workdays. While at weekends, most conflicts occurred during the main visiting period in the afternoon; on workdays, conflicts occurred more often in the later hours of the day (Figure 1). Generally, the higher the use levels were, the more conflicts were recorded, $r = 0.240$, $p < 0.001$. The decrease of user conflicts in autumn was obvious, while in March most of the conflicts (20% of all conflicts) were recorded by video interpreters.

Most conflicts occurred between walkers and bicyclists (38% of all conflicts), followed by intra-activity conflicts of walkers (20%), conflicts between walkers and joggers (18%) and walkers with maintenance cars (7%). Surprisingly low was the conflict potential between

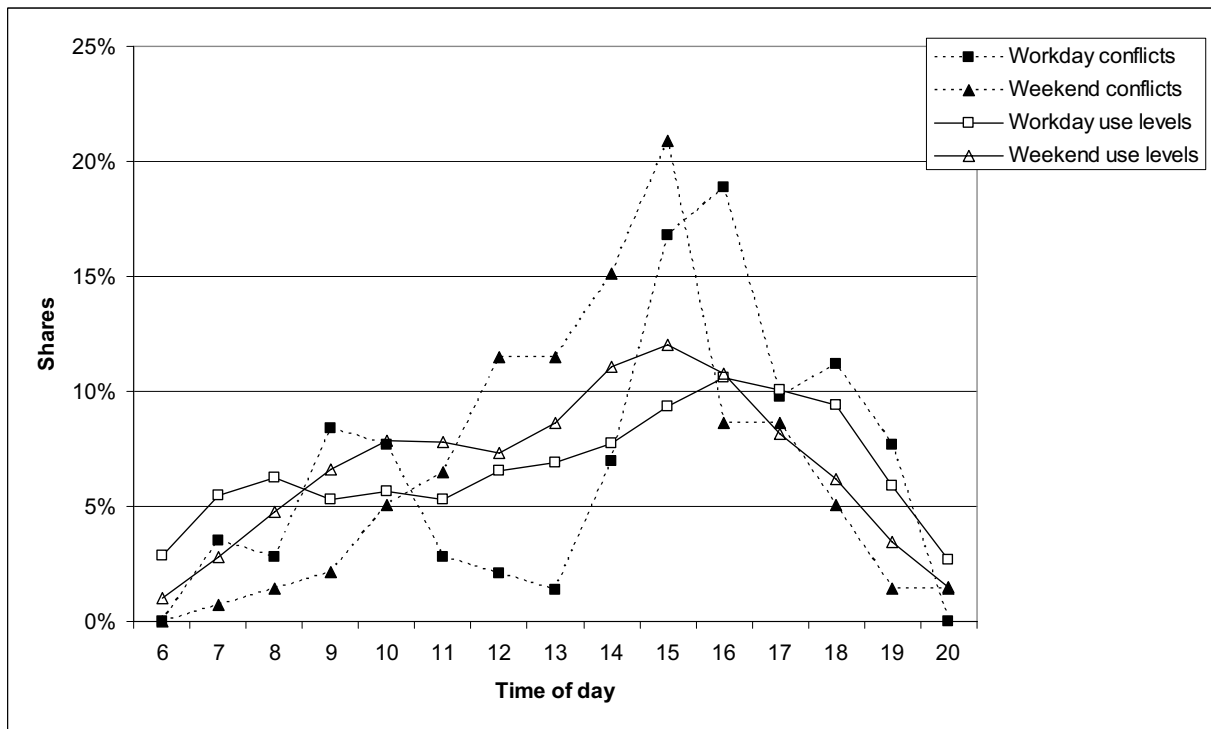


Figure 1: Daily progression of recreation use and user conflicts by weekends (including Saturdays and holidays) and workdays assessed by one-year video monitoring.

dogs and other users. Only 4% of conflicts were with dogs, although dogs were seen by forest visitors as the most annoying factor revealed by on-site interviews. Bigger groups were more likely to be involved in a conflict, in particular groups with children. While 17% of users involved in conflicts were children, the average share of children use was 8%. Some conflicts resulted in accidents, a fall from the bicycle; most often in displacement behaviour, stop of the activity, and alerting behaviour.

Highest shares of conflicts were videotaped at the entrance, where bicyclists could travel with high speed due to the paved surface of the main trail; and where maintenance cars for a local restaurant and many other user groups were present. Thus, mostly conflicts of walkers with fast moving users, i.e. bicyclists, joggers and cars, were recorded; more likely at high use times and over-proportionally involving children. Based on these results, forest management should specifically target the conflict between bicyclists and walkers at the main access points.

Study limitations

Video recordings are an excellent source of information about recreation use and therefore a useful management tool. This study provides information about user conflicts at three access points, however, not about the total amount of occurring conflicts. Such information would require a long-term monitoring of all trails within the forests. Due to precautions taken to ensure the anonymity of the subjects, resulting in a relatively low image resolution of the black-and-white video images and a minimum distance between camera and visitor, video interpreters might have overlooked or misinterpreted some conflicts.

References

- Arnberger, A. (2006). Recreation use of urban forests: An inter-area comparison. In: *Urban Forestry & Urban Greening* (4/3-4), p 135-144.