Relating daily change of visitor number to crowding perception and overall satisfaction in Nature Park Telašćica, Croatia

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Nature Park Telašćica is a protected area situated in the southeastern part of the island of Dugi Otok. It has been protected since 1980 due to valuable plant and animal life, geological and geomorphologic phenomena, and valuable archaeological heritage. There are strong daily and seasonal oscillations in visitor numbers. Seasonally, visitor numbers peak from mid-July to mid-August. During that period, visitor numbers peak daily between 11:00 h and 15:00 h because numerous excursion ships bring large numbers of visitors into the Park during that time.

Large number of visitors at a same time, often resulting in crowding, has been hypothesized to be detrimental to visitor experience. The perception of crowding, however, does not correlate linearly with the actual number of people, but highly depends on the context of the experience. While in concert halls only extremely high densities reduce experience (and some crowding may be essential to a positive experience), even small crowds can be detrimental to an experience in nature, where solitude is sought for. Salt lake Jezero Mir locality of the Park has been suggested to be susceptible to such detrimental effects of crowding because it is a relatively small area frequented by 82% of the Park's visitors.

To test how oscillations in visitor numbers influence visitors' perception of crowding and their overall satisfaction, we continuously monitored visitor movement to and from the Jezero Mir as a part of HRZZ project ACCTA. Visitor movement was then correlated to the results of short, time-stamped exit questionnaires. The continuous monitoring of visitor movement was performed using an Android application developed for this particular purpose. Each passing of a visitor was recorded by logging the time and direction of the movement in the app, and was done simultaneously on three locations surrounding the lake: the entrance to the beach, and two exits/entrances from/to the footpath. From these data, the visitor number at the locality was calculated. To facilitate the survey, the exit questionnaires contained only three questions, translated to eleven languages. The visitors were asked to grade on a nine-point Likert scale their (i) perception of crowding, (ii) how disturbing the crowding was to them, and (iii) overall satisfaction. After grading, every survey was time-stamped by the surveyor.

The monitoring was conducted on two full days, 31.07. and 13.08.2015. In total, 362 questionnaires were collected, of which 356 were complete and included in the analysis. On the first day 84 questionnaires were collected from visitors exiting the

beach, and 44 from visitors exiting the footpath around lake, making the total of 128. During the second day, in total 228 questionnaires were collected (171 beach exit, 57 footpath exit). Each day at least 10% of the visitors exiting the lake area were surveyed.

The analysis of the movement data showed high flow rates of the visitors, both in and out of the locality. Fewer visitors were recorded during the first day compared to the second one. Around 8% of the people reached the lake through alternative routes. The instantaneous number of visitors on the locality varied up to 672 during the first day, and 1041 during the second day. The maximum number of visitors on the locality was recorded around 13:00 on both days.

Preliminary statistical analysis of the questionnaires data was performed. The Pearson's correlation test showed significant ($p<0.01$) but small negative correlation between the visitors' evaluation of disturbance and overall satisfaction. Also significant ($p<0.01$) but small positive correlation was found between visitors' perception of crowding and level of disturbance by the perceived crowding.

To investigate the influence of visitor number oscillations, the data was grouped in hourly time-slots and tested with ANOVA. The visitors' perception of crowding differs significantly between time-slotted groups. For the day in which the larger number of visitors had been recorded, significant difference between time-slotted groups was found for the disturbance by crowding. Nevertheless, none of the groups showed significant decrease in visitor satisfaction, suggesting that – despite relatively large crowding – visitors' positive experience was not reduced.

The two groups of visitors, those arriving by excursion ships (excursionists) and by other means (non-excursionists), might have different expectations and therefore different reactions to crowding. The method used in the study was, however, not sensitive enough to detect the differences in satisfaction levels between the two groups during the peak hours.

During the peak (because of the ratio of excursionists and other visitors) almost the whole sample consisted of guests from excursion ships. While non-excursionists might have been bothered by crowding, the excursionists might have retained satisfaction despite large crowding. Since the excursionists came from an even more crowded ship, what might have seemed as a crowded beach to non-excursionists, might have been a welcome change for the better to the excursionists. This decrease in satisfaction of non-excursionists could not have been detected during large crowds because they constituted only a small fraction of the sample at that time. Non-excursionists constituted the whole sample during times when excursion ships were *not* present. Then, however, there was also no crowding, hence no decrease in satisfaction due to crowding could have been reported.

While the average satisfaction level is always good, anecdotal evidence suggests that non-excursionists were negatively impacted by crowding. While excursionists bring significant earnings to the PA, non-excursionists are more important to the local economy (lodging, restaurants, etc) and their happiness may be a priority. Hence, if non-excursionists are impacted by excursionists, the management should consider crowd control by either reducing the number of excursionists, or educating the non-excursionists on when to expect crowding and suggesting visitation during

off-peak hours. The latter alternative is clearly much more economically rewarding, and provides enjoyment to a greater number of visitors.

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