

# Letter

## Protection of bats in caves opened for tourism: a reply to Furman, Çoraman & Bilgin

We thank Furman et al. (2012) for their response to our research (Paksuz & Özkan, 2012). They have, however, misinterpreted our results from the Dupnisa Cave System in Turkey. Furman et al. assert that we are unclear in comparing the periods before and after tourism, and in our statistical comparisons of bat numbers. Our comparison of bat populations in the period 2002–2003 with those in 2004–2008 is not controversial. As mentioned several times in our article the first 15 surveys were conducted in the period before tourists began visiting, and the later 38 surveys in the period after the cave system was opened for tourism. This means that the periods before and after tourism are clearly separated from each other. To protect the bats and their roosts we designed a management plan (for construction activities, a visitor schedule and gate construction) based on the data of the earlier 15 surveys. Public visits began based on the schedule proposed in the plan. By comparing the data of the two periods we were able to evaluate whether or not the management plan was appropriate for the protection of the bat species in the cave system.

Depending on their seasonal requirements bats have to switch roosts during their life cycle. Seasonal numbers and species diversity of bats in caves are therefore highly variable, and the changes in such sensitive cave ecosystems can only be properly assessed by long-term monitoring. In our article we compared bat numbers and roost use using data collected in our regular monitoring. Furman et al., however, compared our long-term data with the count data of Furman & Özgül (2004), which were not systematically collected. As it was the first study on the counts of bats in this cave system we referred to the study of Furman & Özgül (2004) but we did not compare their findings with ours.

Furman et al. also comment inaccurately on our statistical comparison of bat numbers in the periods before and after the cave system was opened to tourism. We analysed differences in terms of both the total number of bats in the three caves and in each cave, and the statistical results were presented accordingly. A further point needs to be clarified. Furman et al. emphasized that the only significant increase in numbers was observed in Kız Cave, and suggested that bats moved to this less disturbed area.

However, the non-significant differences in bat numbers in the two caves opened to tourism do not necessarily imply any decrease there. As shown in our original Table 1 the differences were not significant but there were slight increases in bat numbers. Furthermore, their suggestion is not supported by the correlations between the uses of the caves by bats. As clearly stated in our article, the correlations revealed the same patterns in the periods before and after tourism.

Furman et al. conclude that ‘The suggestion that tourism can have a beneficial effect on bats should be supported by convincing evidence...’ However, we gave no indication of this notion in our article. Rather, we suggested that ‘... gating of entrances and visits by tourists are not necessarily incompatible with the use of caves by bats...’. We also recommended that an appropriate management plan, backed by long-term monitoring, is necessary to protect bats and their roosts in caves opened to tourism.

To summarize, our results indicate that the seasonal numbers of bats and roost usage in the Dupnisa Cave System were not negatively affected by the controlled visits of tourists. The visitor schedule and the design of the gates appear to be effective in minimizing the negative effects of tourism activities on the bats and in increasing the protection of the bats, respectively. We believe that our study can be a model for the protection of bats in caves opened for tourism.

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