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Letter to the Editor

Should we trust beliefs or data when assessing conservation interventions? A reply to Stoynov 2016

We thank Stoynov (2016) for his interest in conservation actions for Egyptian Vultures in the Balkans (Oppel et al., 2016), and we share the discontentment that the dedicated efforts had only limited effect. Stoynov suggests that we may not have detected positive effects of vulture restaurants because the data may have been biased, and that our conclusions disagree with his firm 'belief' that vulture restaurants contribute to the persistence of Egyptian Vultures. Vulture restaurants can be an important conservation action, and we highlighted several plausible benefits. However, our goal was to find scientific evidence using available data, and we found no increase in breeding success or adult survival probability.

Stoynov's letter conflates two different scientific questions. Our question was *whether* conservation measures, including vulture restaurants, were effective. Having found no evidence that measures were effective in increasing breeding success and survival, the next logical question is to ask *why* some restaurants may not have been effective. Stoynov provides arguments relating to the second question, and these arguments are useful for improving interventions, but they do not invalidate our conclusions.

Stoynov's first concern is that our data may have been 'biased' because vulture restaurants varied in food supply and accessibility, and because other sources of food were available that we did not consider as feeding stations. We acknowledged that vulture restaurants can be fairly heterogeneous (p. 162), but our analysis does not assume that all vulture restaurants are equal, and it does not assume that all food sources are included as 'vulture restaurants'. Because slaughter-house dumps are not a conservation intervention, their effectiveness was not our concern. We found no evidence that breeding success or survival increased near vulture restaurants, and our discussion pointed out why this may have been the case, including concerns that Stoynov repeated. We stated that "several pairs … did not consume any of the provided food" (p. 162), but this does not compromise our conclusions because a vulture restaurant is not effective if the vultures do not consume the food. Stoynov's second concern also addresses the possibility that some vultures may not have consumed food. Whether a vulture uses a restaurant is difficult to know *a priori*, and we caution practitioners that a vulture restaurant is no guarantee that breeding success or survival will increase. We listed multiple explanations (p. 162), and Stoynov provides an additional concern that may limit usage of vulture restaurants. We are pleased that our conclusions stimulated a discussion to improve the implementation of feeding stations in the future.

Stoynov's third concern relates to breeding success of Egyptian Vultures and repeats our discussion (p. 162) that because "nests had high productivity, it was unlikely that management would increase productivity, and the fact that productivity did not decrease … could be considered a success". We actually provided some evidence for Stoynov's belief that vulture restaurants may increase recruitment (Table 2). However, the explicit purpose of vulture restaurants in our project was to increase survival of non-breeding birds, which cannot be objectively evaluated because no data exist. We stated that "central feeding stations may … increase the body condition of nestlings and increase juvenile survival" (p. 162). By contrast, individual feeding sites were provided to increase productivity and adult survival, and it is not 'misguided to consider feeding sites as not fulfilling their stated purpose' if our available data do not provide any evidence that survival and productivity actually increased.

Stoynov claims that Egyptian Vultures have survived near vulture restaurants and slaughter-house dumps. However, it is difficult to disentangle whether the presence of vulture restaurants was the underlying cause of survival or a consequence of vulture restaurants being established only in areas where vultures had actually persisted.

Stoynov also criticises that we made an invalid statement in that 'the risk to consume poisoned bait in the landscape may not be amalgamated by supplementary feeding', which is inconsistent with his personal opinion. We demonstrated that the survival probability of territorial adult birds did not increase with the presence of vulture restaurants, but also cautioned that our analysis 'may not have been sufficiently powerful to estimate the effects of management if these effects are relatively small' (p. 162). Our assessment was the most robust evaluation possible, and is based on data and evidence, which may be preferable to popular opinion when informing conservation management (Sutherland et al., 2004).

We share Stoynov's desire to ensure the survival of Egyptian Vultures in the Balkans and we emphasized that vulture restaurants, individual supplementary feeding, and nest guarding can play an important role in the conservation of this species. However, so far these implementations were based on personal opinions, and our paper provides the first objective assessment of such interventions in the Balkans and highlights that there is substantial room for improvement.

References

Oppel, S., Dobrev, V., Arkumarev, V., Saravia, V., Bounas, A., Kret, E., Skartsi, T., Velevski, M., Stoychev, S., Nikolov, S.C., 2016. Assessing the effectiveness of intensive conservation actions: does guarding and feeding increase productivity and survival of Egyptian vultures in the Balkans? Biol. Conserv. 198, 157–164.

Stoynov, E., 2016. A reply to Oppel et al. concerning "Assessing the effectiveness of intensive conservation actions: does guarding and feeding increase productivity and survival of Egyptian Vultures in the Balkans?". Biol. Conserv. (in press).

Sutherland, W.J., Pullin, A.S., Dolman, P.M., Knight, T.M., 2004. The need for evidence-based conservation. Trends Ecol. Evol. 19, 305–308.

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