Review of: "Social and Environmental Drivers of Black-Necked Crane (BNC) Habitat Suitability in Bhutan: Insights From Maxent Modelling and Conservation Implications"

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Potential competing interests: No potential competing interests to declare.

General comment:

- There is a repetition of some words in the Introduction and historical background sections. The authors can join them in one section. The conservation needs of this species, as well as the importance of the study area for this species, are not well demonstrated there. They should put the most important information relevant for this study, like relevant important information on the species, its real conservation status and needs, as well as the conservation importance of the site: why this site? Is the site a bastion for the reproduction of the species? What is its particularity for the species? etc… All this information should be well presented, and the introduction should end with the aim and goals of the study.
- The Method is not very clear and needs more explanation and justification.

Following are my comments:

TITLE: Is Bhutan the wintering ground or the reproductive ground of the species? That information should be reflected in the title.

INTRODUCTION

- First paragraph, line 1: Put the scientific name in italics and be straightforward, i.e., The black-necked crane*Grus nigricollis* (herein referred to as BNC), ….
- Third paragraph, line 1: The authors mentioned that the species is classified as**Vulnerable**. During searching, I found that the species is listed as **Near Threatened** on the IUCN Red List. Check the two following links for the check-up:

1. http://datazone.birdlife.org/species/factsheet/black-necked-crane-grus-nigricollis/text
2. https://www.iucnredlist.org/search?query=black-necked%20crane&searchType=species

- The species is also listed on CITES Appendix I and II, as well as on CMS Appendix I and II. See link 1 for more information.
- Please also specify the protection status of the species at the national level in its range states.

MATERIALS AND METHODS

- Map not clear, please do well to present the legend items on the map. It is not clear.

- In the historical inventory section, the authors did not well describe how occurrences data were obtained and the methods used. They should well explain it and put, for instance, in a table the number of occurrences per site, the collection data, as well as sources for data from databases.
- Sections 2.2.2. and 2.2.3. can be joined together and should be well described with the source of each variable.
- Why not combine NDVI and EVI in the modelling?
- In table 2, the authors mentioned the land cover change but did not explain how they obtained it. They should well describe how they got each variable.
- Occurrence data listed in table 2 should be removed; they are placed in a table in the historical inventory section as above described.
- In the optimization of occurrence point section, the method used for the spatial sampling bias layer is not clear, and they should explain it very well and give more detail. It is recommended that to check spatial autocorrelation, we need to downweigh locations that are close to one another because they are likely to bias the results. One way to find out is to check for spatial autocorrelation (SAC) in the predictions for those sites with known occurrences. If there is SAC, you need to generate a bias file (e.g., a kernel density distribution map of occurrences) and use that to weight the occurrences. You can check Geuee and Thomassen (2020) for more explanation. The generated layer is used to differentially weight known presences and background points based on sampling effort, where locations in areas of low sampling effort were weighted more heavily than locations in areas where sampling effort was high.
- In section 2.3.2., it is good that they checked for multicollinearity, but they should describe in detail how they selected to remove correlated data and then should finally present here the final variables retained for modelling.
- In section 2.3.3., no need to do a literature review on Maxent; you can shift this to the introduction section. Be straightforward and directly describe what you did.
- Section 3.1. should be moved to the method section.
- Also in the above section, they used a Pearson correlation plot to check for correlation. What about the variance inflation factors, which I guess is more powerful than the Pearson correlation?
- The authors just used two metrics for model evaluation, which is not enough for me. It is recommended and advisable that when using only presence data, it is good to use three metrics for model fit/evaluation: the Boyce Index (Hirzel *et al*. 2006), which is considered the most appropriate measure of model performance with presence-only data; the True Skill Statistic (TSS; Allouche *et al*. 2006); and the AUC (Swets 1988). For both the Boyce Index and the TSS, values of close to 1 indicate good model fit, and 0 indicates models no better than random; for the AUC, values of >0.9 indicate a good fit, and 0.5 indicates the model is no better than random.

References

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