***Editor's comments:***

*~~I now have two completed reviews on your manuscript and based on those reports it may be reconsidered following major revision~~.*

*Reviewer #1 wanted a clearer objective, to which I may add ~~that EcoMod publishes process based models and SDMs are statistical by nature. Early ones wer pubilshed here as new methods and it is the novelty method (not the application) that has the most relevance for EcoMod.~~*

*Reviewer #2 pointed out some potential issues with the method or presence only data. ~~They have both provided you with extensive comments below. Please give a written description of the changes you make in your revision to addreess these comments.~~*  
  
**Response:**

**Although in general terms SDMs can be essentially classified as correlative methods, they have been found as fundamental parts of more mechanistic approaches. As such, it is important to create more robust SDMs to eventually develop more reliable process based models. And this is the main purpose of MinBAR and its approach behind, not to delve into the statistics of the algorithms but to give tools which help modellers to better understand the natural processes and to make better predictions. For that reason, with MinBAR, we address one of the less studied parts of only presence SDMs, and thus probably one of their main weaknesses, which is the accurate delineation of the background area. And because all of this, we believe that our manuscript is adequate to be published in Ecological Modelling.**

**The objectives have now………….**

***Reviewer #1:***

*Dear authors,  
~~This is a very interesting manuscript and very useful in the field~~. After reading the entire manuscript, however, I'm not sure if the manuscript aims (1) to propose a method for choosing the minimum calibration area to pick background points (as the title suggests) or (2) evaluating the validity of building partial models for cases where modeling complete distributions are computationally demanding and, then, how to make the process faster. In my opinion and after reading several times the method, the second option could be more exact. But the important question is, what do you want to show? In addition, little or no discussion of other studies that have also attempted to propose modifications in the selection of the calibration area is included, so it is impossible to know in what state of knowledge we are now.*

**Response:**

**Actually, we pursue both aims mentioned by the Reviewer #1, they are not mutually exclusive. Take two of the case studies presented in the manuscript as examples. On the one hand, case study 1 uses the whole extent of the species and run the function. The result is a set of buffers from which the user can see which one is the minimum that gives sufficient…**

**On the other hand, in the case study on islands (thus partial distributions/models), after running the function, the user can see in the plots if the curve has reached a sufficient level of the evaluator.**

**Now this has been further explained in lines…….**

*OTHER IMPORTANT SPECIFIC COMMENTS AND QUESTIONS ARE BELOW:  
  
LINES 14-15: "One of the crucial choices when modelling species distributions using pseudo-absences approaches is the delineation of the background area to fit the model."  
COMMENT: Because pseudo-absences and background -points- are not exactly the same, I suggest to use something like: "One of the crucial choices when modelling species distributions using pseudo-absences and background approaches is the delineation of the calibration area to fit the model."*

**Response:**

*LINES 16-17: "… around the geographical centre of the species distribution that characterizes".  
COMMENT: What do you think about the environmental (not geographical) center of the species.  
I really think that given that niche models are built in environmental space, the background dataset should be chosen in the context of the environmental conditions in which species may occur or, even more complicated to define, within "the area that has been accessible to the species of interest over relevant time periods" (sensu Barve et al. 2012).  
  
LINES 21-22: "… models (SDMs) until a satisfactory model is reached."  
COMMENT: In terms of some metrics? Ecological realism? Please, specify.  
  
LINES 35-39: "However, regarding the public biodiversity data, they are often limited to only  
species presences and with a lack of occurrences in poorly sampled areas. These facts  
limit the use of some techniques or algorithms and force to make critical assumptions and  
choices, introducing different levels of uncertainty to model predictions (Jarnevich et al.,  
2017)."  
COMMENT: Although I agree with these ideas, I see no obvious connection to the purpose of this study. How do these facts directly affect the selection of the calibration area? Please, read my main concern at the top of the revision.  
  
LINES 40-42: "One of the crucial choices when using pseudo-absences approaches is the delineation of the background area to fit the model, also called "landscape of interest" or "study area"  
(Elith et al., 2011; Raes, 2012)."  
COMMENT: Please, note my comment in the Abstract about the use of pseudoabsences and background points. In addition, I think that "calibration area" is another common and probably more appropriate  term in the field.  
  
LINES 54-56: "Any of these situations usually lead to fit models using only part of the species distribution (i.e. partial models), which might or might not imply a reduction of model performance (El-Gabbas and Dormann, 2018)."  
COMMENT: It does not seem convincing me that these limitations mentioned lead to having to build partial models. In fact, in my experience, I don't think it's a common thing to try to solve the problem building partial models. Do you have more examples of this being a common or suggested strategy?  
  
LINES 60-61: "…both quality of the model and execution time."  
COMMENT: Please clarify what you mean by model quality.  
  
LINE 67: "PROBLEM"  
COMMENT: I am confused with the main problem. Is the problem of not being able to know which is the minimal area to extract the background points (which applies to any species) or the inherent problem when building partial models in the case of species with a very wide geographical distribution? I think both are different things and therefore the solutions might be different.  
  
LINES 91-93: On the other hand, Boyce Index Total (BI\_tot) assesses predictions beyond the training area, across the whole distribution of the species (i.e. model transferability).  
COMMENT: Do you mean that in this case evaluation includes the ability of the "partial model" to predict records in other parts of the distribution not included in the calibration? If so, then I think a quantification of non-analog conditions should be included in the analyses, since the environmental conditions within the calibration area could be more restricted than in the transfer area.  
  
LINES 98-100: "…variables, the function calculates the geographical centre of the species distribution, the most distant occurrence and the buffers. "  
COMMENT: I'd add the assumptions to use the geographical center of the distribution to be used as the main factor to define the calibration area.  Please, add a short sentence about this contentious issue.  
  
LINES 183-184: "… distribution (environmental suitability raster) by means of ENMTools (Warren et al., 2017) using I and D metrics."  
COMMENT: Please, add a description of those metrics, how they are calculated and what they indicate. How are they interpreted?  
  
LINES 188-190: "… of the virtual species (Table 2) gave an average of 0.69 (SD = 0.16) and 0.87 (SD = 0.11) for D and I respectively."  
COMMENT: This result (and Table 2) is not discussed further below. What do those similarity values imply?  
  
LINES 218-219: "Furthermore, the implementation of other algorithms and modelling techniques would be highly convenient  
COMMENT: I am also thinking about the resolution (cell size) of the study. Is there any exercise using a finer resolution?  
  
TABLE 1.  
COMMENT:  Species names must be specified in the first column or in the legend.  They must also specify the unit of measure in the rest of the columns.  
  
TABLE 2.  
COMMENT:  In the legend,  what do those values indicate? How are they interpreted?*

***Reviewer #2:***

*~~Many thanks for inviting me to review the manuscript behind the MinBAR package. I enjoyed reading the text. It is well written with a clear storyline to follow. The codes behind the package are all available on GitHub and I smoothly installed the library from CRAN. The authors are targeting an important issue in modelling the distribution of species which is defining the study area to sample the pseudo-absents.~~ ~~I believe the manuscript offers a valuable contribution to the community of species distribution modellers and nicely fits the scope of the journal. There are, however a few points that I would like to discuss with the authors to be considered in the next revision of the manuscript.~~*

**Response:**

**Thank you for your kind words. Indeed it is an important issue in the field.**

*MinBAR uses the Boyce Index as an evaluation metric. Boyce Index only requires presences and thus appropriate metric in the case of presence-only models. It demonstrated predicted-to-expected ratio across the suitability gradient. My concerns are; a) whether the selected evaluation metric would be appropriate for other presence-absence SDMs too?*

**Response:**

**On the one hand, according to Di Cola et al. (2017) and references therein, Boyce Index is clearly appropriate for models derived using only presences and it is, also, threshold independent when based on a moving window (i.e. continuous Boyce index).**

**On the other hand, by definition (see e.g. Guillera-Arroita et al., 2015), presence-absence modelling algorithms and techniques use data both from where the species has been observed (presences) and from where it has been searched for, but not found (absences). Therefore, in these approaches, the extent of the “background area” (or better called in such cases, e.g., “study area”) comes absolutely well defined by where active fieldwork has been conducted. Consequently, the issue of (somehow randomly) defining the background area by the researcher disappears and, therefore, the use of MinBAR would make no sense.**

*b) considering that the "background" in MaxEnt is different from the pseudo-absences in other SDMs, do authors expect to get the same results with the POC plots (*[*https://doi.org/10.1890/09-07*](https://doi.org/10.1890/09-07)*)?*

**Response:**

*Please add the complete list of parameters (i.e. arguments) used in running MaxEnt. Considering 30% test dataset, 3 model replicates (even with crossvalidation) per buffer seems insufficient, doesn't it?  
  
Authors presented 3 case studies with presence-only species data. I was expecting to see a proof of concept with absence-presence species data too. To use the presence occurrences to run the MaxEnt and use the absence-presence data to report a series of evaluation metrics not only on the discrimination capacity but also on the goodness-of-fit (i.e. calibration) of the models.  
  
Considering the algorithm of MaxEnt it is expected that the broader study area will return models with higher discrimination capacity (this is also visible in supplementary material 3). So the question is that except the technical benefits (i.e. time and computational resource), is there any conceptual benefits in applying MinBAR for users? Authors briefly discuss this in lines 46- 51, but it would be important to elaborate further on the application of the package in selecting the study area not by delimiting but also to set up the minimum extent.  
  
Please add the method used to calculate the "geographical centre fo species distribution" and would be great to have it as a line in Figure 1 and supplementary material 4.  
  
Please add a map to demonstrate the spacial representation of the concept. For example in the case of Fabus sylvatica (fig 1), the presence points, the geographical centre fo species distribution, and the buffers.*

**REFERENCES**

**Di Cola (2017)**