

## Where the wild things were: intrinsic and extrinsic extinction predictors in the world's most depleted mammal fauna

Samuel T. Turvey, Clare Duncan, Nathan S. Upham, Xavier Harrison and Liliana M. Dávalos

### Article citation details

*Proc. R. Soc. B* **288**: 20202905.  
<http://dx.doi.org/10.1098/rspb.2020.2905>

### Review timeline

Original submission: 23 November 2020  
Revised submission: 11 February 2021  
Final acceptance: 12 February 2021

Note: Reports are unedited and appear as submitted by the referee. The review history appears in chronological order.

## Review History

### RSPB-2020-2905.R0 (Original submission)

Review form: Reviewer 1

#### Recommendation

Accept with minor revision (please list in comments)

**Scientific importance: Is the manuscript an original and important contribution to its field?**

Excellent

**General interest: Is the paper of sufficient general interest?**

Excellent

**Quality of the paper: Is the overall quality of the paper suitable?**

Excellent

**Is the length of the paper justified?**

Yes

**Should the paper be seen by a specialist statistical reviewer?**

No

**Do you have any concerns about statistical analyses in this paper? If so, please specify them explicitly in your report.**

No

**It is a condition of publication that authors make their supporting data, code and materials available - either as supplementary material or hosted in an external repository. Please rate, if applicable, the supporting data on the following criteria.**

**Is it accessible?**

Yes

**Is it clear?**

Yes

**Is it adequate?**

Yes

**Do you have any ethical concerns with this paper?**

No

#### **Comments to the Author**

This is a rigorous and skilled analysis of extinctions of mammals species in a part of the world that has lost more species over the last 10,000 years than any other. The analysis clarifies the effects of body mass, island features and duration of human occupation on the likelihood of species extinction. This is relevant to our understanding of biodiversity change in the Caribbean, but also to understanding global patterns of loss of mammalian species. The papers is admirably clear.

I have only one query:

At line 269-270, the authors state their decision to exclude mongoose presence as a predictor variable, because it is correlated with mean elevation (retained). This might need a bit more justification. I can understand that mean elevation may have been preferred because it is a continuous rather than a binary variable, but on the other hand I would have thought that because mongoose presence is potentially a cause of extinction it should be retained in preference to mean elevation (not itself a cause of extinction). Does this decision make any difference to results and interpretation? One of the results of the analysis is that survival is better on low-elevation islands. This could perhaps be an effect of mongoose presence/absence, but that explanation is not really considered in the Discussion. Possibly, it would be worth testing directly whether this pattern is bet explained as a direct effect of mongoose presence/absence.

## **Review form: Reviewer 2**

#### **Recommendation**

Accept with minor revision (please list in comments)

**Scientific importance: Is the manuscript an original and important contribution to its field?**

Excellent

**General interest: Is the paper of sufficient general interest?**

Good

**Quality of the paper: Is the overall quality of the paper suitable?**

Excellent

**Is the length of the paper justified?**

Yes

**Should the paper be seen by a specialist statistical reviewer?**

No

**Do you have any concerns about statistical analyses in this paper? If so, please specify them explicitly in your report.**

No

**It is a condition of publication that authors make their supporting data, code and materials available - either as supplementary material or hosted in an external repository. Please rate, if applicable, the supporting data on the following criteria.**

**Is it accessible?**

Yes

**Is it clear?**

Yes

**Is it adequate?**

Yes

**Do you have any ethical concerns with this paper?**

No

**Comments to the Author**

**Where the wild things were: intrinsic and extrinsic extinction predictors in the world's most depleted mammal fauna**

**Comments to the author(s)**

**Overview**

The manuscript addresses the survival and extinction of mammalian species on Caribbean islands as driven by both naturally occurring and human-caused perturbations. The study focuses on survivorship and extinction selectivity on non-continental shelf islands, accounting for variation in island area, elevation, forest cover, species mass, and volcano and hurricane activity as natural drivers, but also assessing the impacts of human arrival, deforestation, and introduction of invasive species. Results show a strong selection for intermediate body mass in surviving mammals, with the extinction of larger body size being correlated to the arrival of humans. The study further underlines the importance of the increase in extreme weather events in the region, as survivorship probability is negatively associated with hurricane events.

I would like to thank the authors for this well-written and interesting manuscript. Overall, I found it to be an insightful and the discussion to be well and thoroughly thought out. The consideration of multiple time events in human driven perturbations in comparison the natural environmental drivers was particularly interesting. I appreciate the conclusions highlighting particular island regions that could be concentrated on in the future for conservation efforts, making the results of this more applicable to modern ecosystems. I have a few suggestions for consideration which I hope will help strengthen certain points made here.

## General Comments

Elevation and invasive species introductions: Due to finding strong collinearity between mean elevation, maximum elevation, and mongoose presence the authors chose to exclude both maximum elevation and mongoose presence from further analysis. While I understand the removal based on collinearity within the analyses, the removal of mongoose (which here I understood to be a major representative of an invasive species with dramatic effects to natural populations) should be expanded upon in the discussion. While the authors do have some discussion on invasive species, because of this removal the focus is drawn to mean elevation, which may diminish the importance of biotic interactions between species. Mean island elevation was negatively correlated with survival probability, so I would assume mongoose presence would be as well, but the discussion may benefit from taking a deeper dive into this potential overlap of variables. What does this mean when they are considered together?

Mass and selectivity for intermediate size: The strong selectivity for intermediate size in these island populations is highlighted in this study. The authors do a good job discussing how they think each variable may be affecting lower and higher mass groups differently, with humans appearing to negatively impact upper mass groups of mammals and invasive species likely accounting for the removal of lower mass groups. The discussion may benefit from a discussion of how the compression towards an intermediate size may have compounding effects on survivorship or extinction in the future. This may also benefit the concluding remarks highlighting the conservation of certain Caribbean ecosystems for the surviving species of the region.

Additionally, as well as the comparison to Australian fauna, consider adding a couple specific examples to other oceanic islands of more similar sizes to that of your study for further clarity (you may check out Heaney et al 1989 and Alcover et al 1998).

Figures and Tables: It seems that Figure 2 and Table 2 give the same information. I therefore do not think it is necessary to provide both as it does not provide the reader with too much extra information to interpret the results of the study. It may therefore make sense to move one or the other to the supplementary materials section. I personally find the figure easier to compare across the sample-wide effects, though I recognize that the extremes of the high probability intervals for "active volcano" and "forest loss" are not visible in this graphic.

### References

- Alcover JA, Sans A, Palmer M. 1998 The extent of extinctions of mammals on islands. *J. Biogeography* 25, 913-918.
- Heaney, LR, Heideman PD, Rickart EA, Uzzurum RB, Klompen JSH. 1989 Elevational zonation of mammals in the central Philippines. *J. Trop. Ecol.* 5, 259-280.

## Decision letter (RSPB-2020-2905.R0)

05-Feb-2021

Dear Dr Turvey

I am pleased to inform you that your manuscript RSPB-2020-2905 entitled "Where the wild things were: intrinsic and extrinsic extinction predictors in the world's most depleted mammal fauna" has been accepted for publication in *Proceedings B*.

The referee(s) have recommended publication, but also suggest some minor revisions to your manuscript. Therefore, I invite you to respond to the referee(s)' comments and revise your

manuscript. Because the schedule for publication is very tight, it is a condition of publication that you submit the revised version of your manuscript within 7 days. If you do not think you will be able to meet this date please let us know.

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When submitting your revised manuscript, you will be able to respond to the comments made by the referee(s) and upload a file "Response to Referees". You can use this to document any changes you make to the original manuscript. We require a copy of the manuscript with revisions made since the previous version marked as 'tracked changes' to be included in the 'response to referees' document.

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- 2) A separate electronic file of each figure (tiff, EPS or print-quality PDF preferred). The format should be produced directly from original creation package, or original software format. PowerPoint files are not accepted.
- 3) Electronic supplementary material: this should be contained in a separate file and where possible, all ESM should be combined into a single file. All supplementary materials accompanying an accepted article will be treated as in their final form. They will be published alongside the paper on the journal website and posted on the online figshare repository. Files on figshare will be made available approximately one week before the accompanying article so that the supplementary material can be attributed a unique DOI.

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Once again, thank you for submitting your manuscript to Proceedings B and I look forward to receiving your revision. If you have any questions at all, please do not hesitate to get in touch.

Sincerely,

Dr Sasha Dall

mailto:proceedingsb@royalsociety.org

Associate Editor

Board Member: 1

Comments to Author:

I agree with both reviewers that this manuscript is well-written, rigorous and an important question of broad interest. Both reviewers had the same minor concern about omitting mongoose as a predictor variable rather than another correlated variable, given the important role of this invasive predator as a known mechanism of mammal loss on Caribbean islands. I agree that this needs justification.

Reviewer(s)' Comments to Author:

Referee: 1

Comments to the Author(s)

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Referee: 2

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## Decision letter (RSPB-2020-2905.R1)

12-Feb-2021

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