

# Rebecca A. Senior

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## Education

- 2014 – 2018      ♦ **Ph.D., University of Sheffield, UK.**  
Supervisors: Prof David Edwards and Prof Jane Hill  
*The impacts of forest conversion and degradation on climate resilience in the tropics.*  
Investigating how loss and degradation of tropical forests affects species' exposure to climate change and their ability to respond, particularly by exploiting microclimates or shifts in distribution.
- 2010 – 2013      ♦ **B.A. (Hons) Natural Sciences, University of Cambridge, UK.**  
*First Class Honours*

## Research and Other Relevant Experience

- 2019 – .....      ♦ **Postdoctoral Researcher, Princeton University, USA.**  
    ♦ PI: Prof David Wilcove  
    ♦ Exploring the effectiveness of different conservation strategies for recovering threatened species
- 2020      ♦ **Consultant, Boreal Songbird Initiative, USA.**  
    ♦ Literature review of the impacts of anthropogenic change on carbon flux in the Canadian boreal zone
- 2019      ♦ **Postdoctoral Researcher, University of Florida, USA.**  
    ♦ PI: Dr Brett Scheffers  
    ♦ The global distribution of colour in passerines & its relevance for the conservation of traded species
- 2016      ♦ **Knowledge Transfer Executive, Rewilding Britain, UK.**  
    ♦ Synthesising scientific & grey literature to produce guidelines for applying rewilding at small scale  
    ♦ Organising & reporting on a stakeholder workshop on rewilding in the English uplands (Sandom et al., 2019)
- 2014      ♦ **Research Assistant, University of Sheffield, UK.**  
Fieldwork in Bornean rainforest:  
    ♦ PI: Prof David Edwards  
    ♦ Tree-liana interaction networks (Magrach et al., 2016)  
    ♦ Quantifying microclimates using thermal cameras (Scheffers et al., 2017)
- 2013 – 2014      ♦ **Consultant, UNEP-WCMC, Cambridge, UK.**  
    ♦ Updating & analysing UNEP-WCMC Google Scholar profile  
    ♦ Incorporation of fisheries data into the Madingley model
- 2013      ♦ **Intern in the Science programme, UNEP-WCMC, Cambridge, UK.**  
    ♦ Custom Python code to create species richness maps using IUCN range data  
    ♦ Data collation & analysis for the PREDICTS project & associated publications (Hudson et al., 2017; Newbold et al., 2015; Hudson et al., 2014)

## Grants and Awards

- 2021     ♦ **HMEI internship funding (USD \$6,600)**, to host an intern in summer 2021
- 2018     ♦ **ACCE Extension for Publication (£3,600)**, to prepare & submit a high impact manuscript
- ♦ **British Ecological Society travel grant (£500)**, to attend ATBC Annual Meeting
- 2016     ♦ **ACCE Placement Support (£1,500)**, 3-month placement at Rewilding Britain, UK
- ♦ **Departmental travel fund (£800)**, to attend Conservation Asia 2016
- 2014     ♦ **NERC Doctoral Training Partnership studentship**, including stipend (£55,452), research and training grant (£11,000) and fees (£17,484)
- 2013     ♦ **Durham Fund (£1,000)**, for UNEP-WCMC internship
- 2011     ♦ **£1,300** from various sources for Peruvian Amazon expedition
- 2010     ♦ **Eliahou Dangoor Scholarship (£1,000)**, awarded on merit to STEM student

From 2010–2021, I received approximately £14,500 of funding, in addition to my PhD studentship.

## Teaching and Mentoring

- 2019 – . . . . .     ♦ **Undergraduate Students (senior thesis advisees)**  
                               Hana Jiang, Princeton University  
                               Molly Muir, Princeton University, *winner of the senior thesis Conservation Prize*
- 2017 – . . . . .     ♦ **Brilliant Club Tutor**  
                               Design, teach and assess courses in ecology & conservation for students aged 9–17, with weekly University-style tutorials and assignments.
- 2014 – 2018       ♦ **Graduate Teaching Assistant**, University of Sheffield, UK.  
                               R and statistics course for postgraduate students ♦ Undergraduate field courses for modules: ‘Population and Community Ecology’ and ‘Tropical Forest Ecology and Conservation’
- 2013 – 2014       ♦ **Undergraduate Supervisor**, University of Cambridge, UK.  
                               Up to 16 students for modules: ‘Evolution & Behaviour’ and ‘Ecology’  
                               ♦ **A-level Biology Tutor**, Cambridge, UK.





## Professional Development

- 2019 – . . . . .     ♦ **Attendance at Departmental Seminars**, School of Public and International Affairs and Department of Ecology & Evolutionary Biology, Princeton University, USA.
- 2020     ♦ **Using Storytelling to Communicate Science**, science communication workshop with The Goodman Center, hosted by Princeton University, USA.
- 2014 – 2018       ♦ **Doctoral Development Programme**, ACCE Doctoral Training Partnership and the University of Sheffield, UK ♦ Research Ethics and Integrity ♦ Science in Policy Quantitative Skills ♦ Data Management ♦ Careers and Policy ♦ Science & Media
- ♦ **Attendance at Departmental Seminars**, Department of Animal and Plant Sciences, University of Sheffield, UK.
- ♦ **Attendance at Sheffield R Users Group**, Sheffield, UK.
- 2016     ♦ **Bayesian Methods to Fit Statistical Models in Environmental Science**, NERC-funded training course, University of Strathclyde, UK.
- 2015     ♦ **Advanced Environmental Data Analysis using Geographical Information Systems**, NERC-funded training course, Newcastle University, UK.

## Service

- Invited peer review    ♦    Agricultural and Forest Meteorology ♦ Biological Conservation  
 Current Landscape Ecology Reports ♦ Ecography  
 Environmental Conservation ♦ Environmental Management  
 Forest Ecology and Management ♦ Frontiers in Forests and Global Change  
 Global Change Biology ♦ Global Ecology and Biogeography  
 Global Ecology and Conservation ♦ Global Environmental Change  
 Journal of Animal Ecology ♦ Landscape Ecology  
 Methods in Ecology and Evolution ♦ PeerJ ♦ Plant Ecology & Diversity  
 PLOS ONE ♦ Thermal Biology
- Invited grant review    ♦    UKRI Future Leaders Fellowship
- Professional affiliations    ♦    Association for Tropical Biology and Conservation (ATBC)  
 British Ecological Society (BES)

## Skills

- Coding    ♦     = **advanced**, inc. package development and R Markdown  
 python™ = **moderate**, inc. spatial analyses  
 = **basic**, for spatial analyses in Google Earth Engine  
 $\text{\LaTeX}$  = **basic**  
 = experienced in using Git and GitHub for version control & collaboration
- Fieldwork    ♦    Total of **7 months** in **Borneo lowland rainforest**. In 2015, **led project** to quantify microclimates and microhabitats in selectively logged and unlogged forests, using thermal camera and dataloggers. Assisted in 2014 project to assess tree-liana interaction networks.
- Additional experience of assisting biodiversity surveys in **Peruvian Amazon** (5 weeks), and **deserts and mountains of Oman** (6 weeks).
- Statistics    ♦    Experience of advanced statistical techniques including general and generalized linear models, additive models, mixed models and principal component analysis ♦ Familiarity with Bayesian methods.
- GIS    ♦    Spatial analyses using R, Google Earth Engine, QGIS and ArcGIS.
- Public Engagement    ♦    Invited panellist for University of Sheffield debate: “Visions of Nature in a World of 10 Billion” (2017) ♦ British Ecological Society (BES) “Roadie” at Wychwood Festival (2016) ♦ Talk & practical session with Earthwatch Institute in Malua, Borneo (2015) ♦ Designed and hosted ecology stall at Discovery Night, University of Sheffield, UK (2015).
- Driving    ♦    Full, clean UK driving licence.

## Media Coverage

- 2019    ♦    *Thermal Images in R*, **Methods.blog**, 21 August.  
 ♦    *Tropical biodiversity faces intersecting threats*, **Physics Today**, 25 July.  
 ♦    *Deforestation + climate change = dead end for wildlife*, **Agence France Presse**.
- 2017    ♦    **BBC Radio Sheffield**, live radio interview discussing microclimates in logged forests.  
 ♦    *Logged forests still offer refuge for endangered tropical species*, **Environmental Research Web**, 27 October.
- 2016    ♦    *Public engagement training & Wychwood*, **BES Bulletin**, Issue 15.

## Research Publications

I have **14 publications** in international peer-reviewed journals, including **5 first author** articles. My **h-index = 10**, **i10-index = 10**, and **total citations = 2226** (as per Google Scholar Citations).

### Published

- 1 Lembrechts, J. J., Aalto, J., Ashcroft, M. B., Frenne, P. D., Kopecký, M., Lenoir, J., Luoto, M., Maclean, I. M. D., ... Nijs, I. (2020). SoilTemp: A global database of near-surface temperature. *Global Change Biology*, *n/a*(n/a). doi:10.1111/gcb.15123
- 2 **Senior, R. A.** (2020). Hot and bothered: The role of behaviour and microclimates in buffering species from rising temperatures. *Journal of Animal Ecology*, *89*(11), 2392–2396. doi:https://doi.org/10.1111/1365-2656.13363
- 3 Borrell, J. S., Al Issaey, G., Lupton, D. A., Starnes, T., Al Hinaï, A., Al Hatmi, S., **Senior, R. A.**, Wilkinson, T., ... Patzelt, A. (2019). Islands in the desert: Environmental distribution modelling of endemic flora reveals the extent of Pleistocene tropical relict vegetation in southern Arabia. *Annals of Botany*, *124*(3), 411–422. doi:10.1093/aob/mcz085
- 4 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2019a). Global loss of climate connectivity in tropical forests. *Nature Climate Change*, *9*(8), 623–626. doi:10.1038/s41558-019-0529-2
- 5 Jucker, T., Jackson, T., Zellweger, F., Swinfield, T., Gregory, N., Williamson, J., Slade, E., Phillips, J. W., ... Coomes, D. A. (2019). A research agenda for microclimate ecology in human-modified tropical forests. *Frontiers in Forests and Global Change*, *2*. doi:10.3389/ffgc.2019.00092
- 6 Sandom, C. J., Dempsey, B., Bullock, D., Ely, A., Jepson, P., Jimenez-Wisler, S., Newton, A., Pettorelli, N. & **Senior, R. A.** (2019). Rewilding in the English uplands: Policy and practice. *Journal of Applied Ecology*, *56*(2), 266–273. doi:10.1111/1365-2664.13276
- 7 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2019b). ThermStats: An R package for quantifying surface thermal heterogeneity in assessments of microclimates. *Methods in Ecology and Evolution*, *10*(9), 1606–1614. doi:10.1111/2041-210X.13257
- 8 **Senior, R. A.**, Hill, J. K., Benedick, S. & Edwards, D. P. (2018). Tropical forests are thermally buffered despite intensive selective logging. *Global Change Biology*, *24*(3), 1267–1278. **Cover article.** doi:10.1111/gcb.13914
- 9 Hudson, L. N., Newbold, T., Contu, S., Hill, S. L. L., Lysenko, I., De Palma, A., Phillips, H. R. P., Alhusseini, T. I., ... Purvis, A. (2017). The database of the PREDICTS (Projecting Responses of Ecological Diversity In Changing Terrestrial Systems) project. *Ecology and Evolution*, *7*(1), 145–188. doi:10.1002/ece3.2579
- 10 Scheffers, B. R., Edwards, D. P., Macdonald, S. L., **Senior, R. A.**, Andriamahohatra, L. R., Roslan, N., Rogers, A. M., Haugaasen, T., ... Williams, S. E. (2017). Extreme thermal heterogeneity in structurally complex tropical rain forests. *Biotropica*, *49*(1), 35–44. doi:10.1111/btp.12355
- 11 **Senior, R. A.**, Hill, J. K., González del Pliego, P., Goode, L. K. & Edwards, D. P. (2017). A pantropical analysis of the impacts of forest degradation and conversion on local temperature. *Ecology and Evolution*, *7*(19), 7897–7908. doi:10.1002/ece3.3262
- 12 Magrath, A., **Senior, R. A.**, Rogers, A., Nurdin, D., Benedick, S., Laurance, W. F., Santamaria, L. & Edwards, D. P. (2016). Selective logging in tropical forests decreases the robustness of liana–tree interaction networks to the loss of host tree species. *Proc. R. Soc. B*, *283*(1826), 20153008. doi:10.1098/rspb.2015.3008

- 13 Newbold, T., Hudson, L. N., Hill, S. L. L., Contu, S., Lysenko, I., **Senior, R. A.**, Börger, L., Bennett, D. J., ... Purvis, A. (2015). Global effects of land use on local terrestrial biodiversity. *Nature*, 520(7545), 45–50. doi:10.1038/nature14324
- 14 Hudson, L. N., Newbold, T., Contu, S., Hill, S. L. L., Lysenko, I., De Palma, A., Phillips, H. R. P., **Senior, R. A.**, ... Purvis, A. (2014). The PREDICTS database: A global database of how local terrestrial biodiversity responds to human impacts. *Ecology and Evolution*, 4(24), 4701–4735. doi:10.1002/ece3.1303

### Submitted/In Review

- 1 **Senior, R. A.** & Wilcove, D. S. (*to be submitted to Nature Communications in February, 2021*). The benign neglect of the world's threatened species.
- 2 **Senior, R. A.**, Oliveira, B. F., Dale, J. & Scheffers, B. R. (*submitted*). Wildlife trade targets colorful birds and threatens the aesthetic value of nature. *PNAS*.
- 3 Lin, B., Dietrich, M. L., **Senior, R. A.** & Wilcove, D. S. (*in review*). A better classification of “wet markets” is key to safeguarding human health and biodiversity. *The Lancet Planetary Health*.

### Invited Talks

- 2020 ♦ *Connectivity under climate change in tropical forests*, ESA 2020, Salt Lake City, USA\*.
- 2019 ♦ *Forest loss and climate change in the tropics*, University of Florida, USA.
- 2017 ♦ *Thermal Images in R*, Sheffield R Users Group, Sheffield, UK.
- 2016 ♦ *Are selectively logged forests climate change ready?*, Future Cities Laboratory, Singapore.

\*cancelled due to COVID-19

### Conferences

- 1 **Senior, R. A.** & Wilcove, D. S. (2019). Effectiveness of different conservation strategies for recovering threatened species, Belfast, UK: Oral presentation at BES Annual Meeting.
- 2 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2018a). Global loss of climate connectivity in tropical forests, Kuching, Malaysia: Oral presentation at ATBC Annual Meeting.
- 3 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2018b). Global loss of climate connectivity in tropical forests, Tihany, Hungary: Oral presentation at SCCS Europe.
- 4 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2017). Microclimates in logged tropical forest, University of Cambridge, UK: Oral presentation at SCCS Cambridge.
- 5 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2016a). Are degraded forests climate change ready?, Oral presentation at Conservation Asia 2016, joint meeting of the Society for Conservation Biology (SCB) Asia section, the Association for Tropical Biology and Conservation (ATBC) Asia-Pacific chapter. National University of Singapore, Singapore. *Shortlisted for best student talk*.
- 6 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2016b). Are degraded forests climate change ready?, University of York, UK: Oral presentation at ACCE Annual Meeting.
- 7 **Senior, R. A.**, Hill, J. K. & Edwards, D. P. (2015). Impacts of selective logging on thermal heterogeneity in a tropical rainforest, Poster presentation at BES Annual Meeting, Edinburgh, UK. *Shortlisted for best student poster*.

## References

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