

Rebecca A. Senior

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Professional Appointments

- 2022 – ♦ **Assistant Professor, Department of Biosciences, Durham University, UK.**
- 2019 – 2021 ♦ **Postdoctoral Researcher, Princeton University, USA. PI: Prof David Wilcove.**

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 Experience

- 2020 ♦ **Consultant, Boreal Songbird Initiative, USA.**
 ♦ Literature review of the impacts of anthropogenic change on carbon flux in the Canadian boreal zone
- 2019 ♦ **Visiting Researcher, University of Florida, USA. PI: Dr Brett Scheffers.**
- 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)

Research Publications

I have **18 publications** in international peer-reviewed journals, including **6 first author** articles. My **h-index = 14**, **i10-index = 15**, and **total citations = 3971** (as per Google Scholar Citations).

- 1 Ma, L., Conradie, S. R., Crawford, C. L., Gardner, A. S., Kearney, M. R., Maclean, I. M. D., McKechnie, A. E., Mi, C.-R., ... Wilcove, D. S. (2023). Global patterns of climate change impacts on desert bird communities. *Nature Communications*, 14(1), 211. <https://doi.org/10.1038/s41467-023-35814-8>
- 2 Senior, R. A., Oliveira, B. F., Dale, J., & Scheffers, B. R. (2022). Wildlife trade targets colorful birds and threatens the aesthetic value of nature. *Current Biology*, 32(19), 4299–4305.e4. <https://doi.org/10.1016/j.cub.2022.07.066>
- 3 Lembrechts, J. J., van den Hoogen, J., Aalto, J., Ashcroft, M. B., De Frenne, P., Kemppinen, J., Kopecký, M., Luoto, M., ... Lenoir, J. (2021). Global maps of soil temperature. *Global Change Biology*, n/a(n/a). <https://doi.org/https://doi.org/10.1111/gcb.16060>
- 4 Lin, B., Dietrich, M. L., Senior, R. A., & Wilcove, D. S. (2021). A better classification of wet markets is key to safeguarding human health and biodiversity. *The Lancet Planetary Health*, 5(6), e386–e394. [https://doi.org/https://doi.org/10.1016/S2542-5196\(21\)00112-1](https://doi.org/https://doi.org/10.1016/S2542-5196(21)00112-1)
- 5 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). <https://doi.org/10.1111/gcb.15123>
- 6 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. <https://doi.org/https://doi.org/10.1111/1365-2656.13363>
- 7 Borrell, J. S., Al Issaey, G., Lupton, D. A., Starnes, T., Al Hinai, 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. <https://doi.org/10.1093/aob/mcz085>
- 8 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. <https://doi.org/10.1038/s41558-019-0529-2>
- 9 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. <https://doi.org/10.3389/ffgc.2019.00092>
- 10 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. <https://doi.org/10.1111/1365-2664.13276>
- 11 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. <https://doi.org/10.1111/2041-210X.13257>
- 12 Senior, R. A., Hill, J. K., Benedick, S., & Edwards, D. P. (2018). Tropical forests are thermally buffered despite intensive selective logging [**Cover article**]. *Global Change Biology*, 24(3), 1267–1278. <https://doi.org/10.1111/gcb.13914>
- 13 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. <https://doi.org/10.1002/ece3.2579>
- 14 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. <https://doi.org/10.1111/btp.12355>
 - 15 **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. <https://doi.org/10.1002/ece3.3262>
 - 16 Magrach, 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. <https://doi.org/10.1098/rspb.2015.3008>
 - 17 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. <https://doi.org/10.1038/nature14324>
 - 18 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. <https://doi.org/10.1002/ece3.1303>

Grants and Awards

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|------|--|
| 2022 | <ul style="list-style-type: none"> ◇ Durham University Seedcorn Fund (£15,000), rewilding of microclimates ◇ Royal Geographical Society (£2,960), fieldwork & workshops with Oman Botanic Garden ◇ Anglo-Omani Society (£6,000), fieldwork & workshops with Oman Botanic Garden |
| 2021 | <ul style="list-style-type: none"> ◇ HMEI internship funding (USD \$6,600), to host an intern in summer 2021 |
| 2018 | <ul style="list-style-type: none"> ◇ 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 | <ul style="list-style-type: none"> ◇ ACCE Placement Support (£1,500), 3-month placement at Rewilding Britain, UK ◇ Departmental travel fund (£800), to attend Conservation Asia 2016 |
| 2014 | <ul style="list-style-type: none"> ◇ NERC Doctoral Training Partnership studentship, including stipend (£55,452), research and training grant (£11,000) and fees (£17,484) |
| 2013 | <ul style="list-style-type: none"> ◇ Durham Fund (£1,000), for UNEP-WCMC internship |
| 2011 | <ul style="list-style-type: none"> ◇ £1,300 from various sources for Peruvian Amazon expedition |
| 2010 | <ul style="list-style-type: none"> ◇ Eliahou Dangoor Scholarship (£1,000), awarded on merit to STEM student |

Invited Talks

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| 2023 | <ul style="list-style-type: none"> ◇ <i>The impacts of logging on tropical rainforest microclimates</i>, Alfred Wallace seminar series, Universidade de Évora, Portugal. |
| 2022 | <ul style="list-style-type: none"> ◇ <i>Forest loss and climate change in the tropics</i>, conservation seminar series, University of Sheffield, UK. ◇ <i>Keynote Speaker</i>, Microclimate Ecology & Biogeography Conference 2022, University of Antwerp, Belgium. |

Invited Talks (continued)

- ◇ *Global patterns of conservation action and inaction*, Cambridge Conservation Initiative, Cambridge, UK.
- 2021 ◇ *Using technology and open data to understand problems and provide solutions in conservation*, Yale University, USA.
- ◇ *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.

*moved online due to COVID-19

Conferences

- 1 Senior, R. A., & Wilcove, D. S. (2019). *Effectiveness of different conservation strategies for recovering threatened species*. 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*. 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*. Oral presentation at SCCS Europe.
- 4 Senior, R. A., Hill, J. K., & Edwards, D. P. (2017). *Microclimates in logged tropical forest*. Oral presentation at SCCS Cambridge.
- 5 Senior, R. A., Hill, J. K., & Edwards, D. P. (2016a). *Are degraded forests climate change ready?* [*Shortlisted for best student talk*]. Oral presentation at Conservation Asia 2016, joint meeting of the Society for Conservation Biology (SCB) Asia section; the Association for Tropical Biology; Conservation (ATBC) Asia-Pacific chapter. National University of Singapore, Singapore.
- 6 Senior, R. A., Hill, J. K., & Edwards, D. P. (2016b). *Are degraded forests climate change ready?* 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* [*Shortlisted for best student poster*]. Poster presentation at BES Annual Meeting. Edinburgh, UK.

Service

- Invited peer review ◇ Agricultural and Forest Meteorology ◇ Biological Conservation
Current Landscape Ecology Reports ◇ Ecography
Environmental Conservation ◇ Environmental Management
Environmental Research Letters ◇ 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
The Lancet Planetary Health ◇ Landscape Ecology
Methods in Ecology and Evolution ◇ Nature Ecology & Evolution
PeerJ ◇ Plant Ecology & Diversity ◇ PLOS ONE
Remote Sensing of Environment ◇ Thermal Biology
- Invited grant review ◇ Royal Geographical Society
UKRI Future Leaders Fellowship

Service (continued)

- Committee membership ♦ NERC Liason Group, Durham University
- Conference Organisation ♦ Organising and Scientific Steering Committee, 2023 Species on the Move conference
- Professional affiliations ♦ British Ecological Society member (BES)
British Mycological Society member (BMS)
Royal Geographical Society fellow (RGS)

Teaching and Mentoring

Postgraduate

- 2022-present ♦ **Kian Hayles-Cotton**, MBIol, expected graduation in 2023
- 2023-present ♦ **Cameron Goodhead**, PhD, expected graduation in 2027

Undergraduate

- 2022-present ♦ **Durham University**
Level 3 Terrestrial Ecology Field Course
Level 3 Literature Review
- 2021 ♦ **HMEI Internship**
Sophia Richter, Princeton University
- 2019 – 2021 ♦ **Undergraduate Students (senior thesis advisees)**
Hana Jiang, Princeton University
Molly Muir, Princeton University, *winner of the senior thesis Conservation Prize*
- 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'

Secondary school

- 2017 – 2021 ♦ **Brilliant Club Tutor**
Design, teach and assess courses in ecology & conservation for students aged 9-17, with weekly University-style tutorials and assignments.
- 2013 – 2014 ♦ **A-level Biology Tutor**, Cambridge, UK.





Professional Development

- 2022-present ♦ **Postgraduate Certificate in Academic Practice**, Durham University, UK.
- 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 Sheffield R Users Group**, Sheffield, UK.

Professional Development (continued)

- 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.

Skills

- Coding ♦  = **advanced**, inc. package development and R Markdown
 ♦  = **moderate**, inc. spatial analyses
 ♦  = **basic**, for spatial analyses in Google Earth Engine
 ♦ \LaTeX = **basic**
 ♦  = experienced in using Git and GitHub for version control & collaboration
- Fieldwork ♦ Extensive experience organising and leading fieldwork in remote locations, including **deserts and mountains of Oman** (9 weeks over 3 expeditions in 2017, 2018 and 2022) and total of **7 months** in **Borneo lowland rainforest**, over 2014 and 2015.
- Additional experience of assisting biodiversity surveys in **Peruvian Amazon** (5 weeks), and **various habitats across the UK**.
- 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).
- First Aid ♦ Wilderness First Aid (valid to May 2025).
- Driving ♦ Full, clean UK driving licence.

Media Coverage

- 2022 ♦ Senior et al. (2022) “Wildlife trade targets colorful birds and threatens the aesthetic value of nature”, *Current Biology*, received widespread coverage in the media, including: **BBC News**, **Independent**, **Mongabay**, **South Africa Today** and **The Conversation**.
- ♦ **BBC Radio 4 Inside Science**, live radio interview discussing trade of colourful birds.
- 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.