

Rebecca A. Senior

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Professional Appointments

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

Education

- 2014 – 2018 ♦ **Ph.D. in Ecology & Conservation, 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

Professional Experience

- 2020 ♦ **International Boreal Conservation Campaign, USA. Consultant.**
♦ Review of how forest management practices impact carbon cycles & stocks
- 2019 ♦ **University of Florida, USA. Visiting Researcher. PI: Dr Brett Scheffers.**
- 2016 ♦ **Rewilding Britain, UK. Knowledge Transfer Executive.**
♦ 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 ♦ **University of Sheffield, UK. Research Assistant. PI: Prof David Edwards.**
Fieldwork in Bornean rainforest:
♦ Tree-liana interaction networks (Magrach et al., 2016)
♦ Quantifying microclimates using thermal cameras (Scheffers et al., 2017)
- 2013 – 2014 ♦ **UNEP-WCMC, Cambridge, UK. Consultant.**
♦ Updating & analysing UNEP-WCMC Google Scholar profile
♦ Incorporation of fisheries data into the Madingley model
- 2013 ♦ **UNEP-WCMC, Cambridge, UK. Science Intern.**
♦ 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)
- 2011 ♦ **British Exploring, UK. Peruvian Amazon Expedition Explorer.**
♦ Assisting in caiman, mammal & bird surveys

Research Publications

I have **22 publications** in international peer-reviewed journals, including **8 first author** articles. My **h-index = 15**, **i10-index = 18**, and **total citations = 5,185** (as per Google Scholar Citations).

- 1 Kemppinen, J., Lembrechts, J., van Meerbeek, K., Carnicer, J., Chardon, N. I., Kardol, P., Lenoir, J., Liu, D., ... de Frenne, P. (2024). Microclimate, an important part of ecology and biogeography. *Global Ecology and Biogeography*.
- 2 **Senior, R. A.**, Bagwyn, R., Leng, D., Killion, A. K., Jetz, W., & Wilcove, D. S. (2024). Global shortfalls in documented actions to conserve biodiversity. *Nature*, 1–5.
<https://doi.org/10.1038/s41586-024-07498-7>
- 3 Santos, E. G., Svátek, M., Nunes, M. H., Aalto, J., **Senior, R. A.**, Matula, R., Plichta, R., & Maeda, E. E. (2024). Structural changes caused by selective logging undermine the thermal buffering capacity of tropical forests. *Agricultural and Forest Meteorology*, 348, 109912.
<https://doi.org/10.1016/j.agrformet.2024.109912>
- 4 Zeng*, Y., **Senior***, R. A., Crawford, C. L., & Wilcove, D. S. (2023). Gaps and weaknesses in the global protected area network for safeguarding at-risk species [*joint first author]. *Science Advances*, 9(22), eadg0288. <https://doi.org/10.1126/sciadv.adg0288>
- 5 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>
- 6 **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>
- 7 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>
- 8 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)
- 9 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>
- 10 **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>
- 11 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>
- 12 **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>
- 13 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>
- 14 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>
 - 15 **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>
 - 16 **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>
 - 17 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>
 - 18 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>
 - 19 **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>
 - 20 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. <https://doi.org/10.1098/rspb.2015.3008>
 - 21 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>
 - 22 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

Successful

- 2023 ♦ **HFSP, Research Grant** (\$1,350,000), co-I.
"Quantifying The 4-dimensional Microenvironment To Explain The Coexistence Of Social Insects."
- ♦ **Durham University, Seedcorn Fund** (£15,000), PI.
"Rewilding microclimates to conserve UK biodiversity under climate change."
- 2022 ♦ **Royal Geographical Society, Small Research Grant** (£2,960), PI.
"Investigating the microclimate niche of threatened Omani plant species in the Western Hajar Mountains."
- ♦ **Anglo-Omani Society** (£6,000), co-I.
"Investigating the microclimate niche of threatened Omani plant species in the Western Hajar Mountains."
- 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**, stipend (£55,452), research and training grant (£11,000) and fees (£17,484).
- 2013 ♦ **Durham Fund** (£1,000), for UNEP-WCMC internship.

Unsuccessful

- 2024 ♦ **Rewilding Britain, Rewilding Innovation Fund** (£15,000), PI.
"The Rewilding Microclimate Project."
- 2023 ♦ **NERC, Pushing the Frontiers** (£950,443), PI.
"Redefining Extinction Risk Due To Climate Change."
- ♦ **NERC, Centre for Doctoral Training** (£2,437,344), co-I.
"Marginal Lands and Ecosystem Services (MILES) in a period of rapid change."
- ♦ **NERC, Large Grant** (£526,258), co-I.
"The Forgotten Forests: Uncovering The Potential Of Wet Woodlands As Nature Based Solutions."
- 2022 ♦ **British Ecological Society, Small Research Grant** (£4,970), PI.
"Investigating the microclimate niche of threatened Omani plant species in the Western Hajar Mountains."
- ♦ **Woodland Trust, Small Research Grant** (£58,962), co-I.
"Effective landscape-scale management tools for established and establishing woodlands."
- ♦ **Global Partnerships Seedcorn Fund** (£41,834), co-I.
"NI RAP-THERM: Rapid Thermal Ecology Using Next Generation Technology."
- 2020 ♦ **NERC, Independent Research Fellowship** (£598,358), PI.
"Redefining extinction risk due to climate change."

Awards

- 2023 ♦ **Founders' Prize, British Ecological Society**, awarded to an outstanding early career ecologist who is starting to make a significant contribution to the science of ecology
- 2010 ♦ **Eliahou Dangoor Scholarship**, awarded on merit to STEM student

Conferences

- 1 **Senior, R. A., Hill, J. K., & Edwards, D. P. (2023).** *Global loss of climate connectivity in tropical forests*. Oral presentation at Species on the Move Conference.
- 2 Zeng, Y., **Senior, R. A., Crawford, C. L., & Wilcove, D. S. (2023).** *The challenge of conserving species with limited available habitat*. Oral presentation at BES Annual Meeting.
- 3 **Senior, R. A., & Wilcove, D. S. (2019).** *Effectiveness of different conservation strategies for recovering threatened species*. Oral presentation at BES Annual Meeting.
- 4 **Senior, R. A., Hill, J. K., & Edwards, D. P. (2018a).** *Global loss of climate connectivity in tropical forests*. Oral presentation at ATBC Annual Meeting.
- 5 **Senior, R. A., Hill, J. K., & Edwards, D. P. (2018b).** *Global loss of climate connectivity in tropical forests*. Oral presentation at SCCS Europe.
- 6 **Senior, R. A., Hill, J. K., & Edwards, D. P. (2017).** *Microclimates in logged tropical forest*. Oral presentation at SCCS Cambridge.
- 7 **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.
- 8 **Senior, R. A., Hill, J. K., & Edwards, D. P. (2016b).** *Are degraded forests climate change ready?* Oral presentation at ACCE Annual Meeting.
- 9 **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.

Invited Talks

- 2023 ♦ **Keynote Speaker**, Postgraduate Conference 2023, **Cardiff University**, UK.
- ♦ *The impacts of logging on tropical rainforest microclimates*, **Universidade de Évora**, Portugal.
- 2022 ♦ *Forest loss and climate change in the tropics*, **University of Sheffield**, UK.
- ♦ **Keynote Speaker**, **Microclimate Ecology & Biogeography Conference 2022**, University of Antwerp, Belgium.
- ♦ *Global patterns of conservation action and inaction*, **Cambridge Conservation Initiative**, 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*, **Ecological Society of America Conference 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.

Service

- Invited peer review ◇ For >25 journals including:
 Agricultural and Forest Meteorology ◇ Biological Conservation
 Biogeosciences ◇ **Conservation Letters**
 Current Landscape Ecology Reports ◇ Ecography ◇ **Ecology Letters**
 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
 Journal of Environmental Management ◇ 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
- Postgraduate examiner ◇ 2023 — PhD External Examiner, University of Exeter
 2023 — MRes Internal Examiner, Durham University
- University citizenship ◇ NERC Liaison Group, Durham University
 Exchange Coordinator, Dept. Biosciences, Durham University
 EDI Committee, Dept. Biosciences, Durham University
 Athena Swan Working Group, Dept. Biosciences, Durham University
 REF Impact Working Group, Dept. Biosciences, Durham University
- External committees ◇ Rewilding Metrics Advisory Group, Rewilding Britain
 Rewilding Special Interest Group, British Ecological Society
 Publications Committee, British Ecological Society
- Conference organisation ◇ 2025 BES Rewilding SIG “Science of Rewilding” event
 2023 Species on the Move conference
- Professional affiliations ◇ British Ecological Society member (BES)
 British Mycological Society member (BMS)
 Royal Geographical Society fellow (RGS)





Professional Development

- 2023–present ◇ **Postgraduate Certificate in Academic Practice & FHEA**, Durham University.
- 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.
- 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.

Media Coverage

- 2023 ♦ **The Knepp Wildland Podcast**, Episode 25, “*The Microclimate*”, 9 October.
- 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**, **The 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.

Skills

- Coding ♦  = **advanced**, inc. package development and R Markdown.
- ♦  = **moderate**, including spatial analyses.
- ♦  = **basic**, for spatial analyses in Google Earth Engine.
- ♦ **LaTeX** = **basic**
- ♦  = Git and GitHub for version control & collaboration.
- Fieldwork ♦ Extensive experience organising and leading fieldwork in remote locations, including **deserts and mountains of Oman** (3 expeditions in 2017, 2018 and 2022) and total of **7 months** in **Borneo rainforest**, over 2014 and 2015. Biodiversity surveys in **Peruvian Amazon** (5 weeks), and **various habitats across the UK**, e.g. uplands, chalk grassland, woodlands.
- Field skills ♦ Extensive knowledge of history of British countryside ♦ Competent ID of several taxa: **fungi, vascular plants, mammals, birds** ♦ Experienced in forestry techniques ♦ User and developer of modern technologies for monitoring, including **satellite imagery, drones, microclimate dataloggers, camera traps, acoustic recorders, thermal imaging**.
- Outdoor skills ♦ **Experienced outdoor leader**: solo, with peers & as a Civilian Instructor for the RAF Air Cadets ♦ Mountain Leader Trained, not yet assessed.
- First Aid ♦ **Wilderness First Aid** (valid to May 2025).
- GIS ♦ **Spatial analyses** using R, Google Earth Engine, QGIS and ArcGIS.
- Statistics ♦ Experience of **advanced statistical techniques** including general and generalized linear models, additive models, mixed models and principal component analysis ♦ Familiarity with Bayesian methods.
- 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).
- Languages ♦ English (native) ♦ Spanish (basic) ♦ Scottish Gaelic (learning)
- Driving ♦ Full, clean UK driving licence ♦ 4x4 driving experience.

Teaching and Supervision

Postgraduate

- 2023-present ♦ Teaching: **Principles of GIS**
- 2024-present ♦ **Joshua Taylor**, MRes, expected graduation in 2025
- 2023-present ♦ **Vita Milana**, MBiol, expected graduation in 2024
- ♦ **Jack Marchant**, PhD, expected graduation in 2027
- ♦ **Cameron Goodhead**, PhD, expected graduation in 2027
- 2022–2023 ♦ **Kian Hayles-Cotton**, MBiol

Undergraduate

- 2023-present ♦ **Durham University**
Level 3 Conservation Biology
Level 3 Research Project
- 2022-present ♦ **Durham University**
Level 3 Field Course
Level 3 Literature Review
- 2021 ♦ **HMEI Internship**
Sophia Richter, Princeton University
- 2019 – 2021 ♦ **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:
‘Population & Community Ecology’, ‘Tropical Forest Ecology & 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**
Designed, taught and assessed University-style courses in ecology & conservation
for students aged 9–17 in underprivileged schools.
- 2013 – 2014 ♦ **A-level Biology Tutor**, Cambridge, UK.