**Joe Millard— Leverhulme Early Career Fellow**
Address: 11 Beechwood Avenue, Bottisham, Cambridge, CB259BE
Email: joeymillard@hotmail.co.uk; Mobile: 0758 4168 355; Website: https://joemillard.github.io/

## SUMMARY

I'm a Leverhulme Early Career Fellow at the University of Cambridge, broadly interested in the causes and consequences of global biodiversity change, ecological economics, digital metrics for monitoring human-nature interactions, evidence synthesis, and the application and ethics of AI in research. Prior to my current position I worked at the Natural History Museum as a postdoctoral researcher, and prior to that at the Leverhulme Centre for Demographic Science as a data scientist and honorary non-stipendiary research fellow (Nuffield College). I completed a PhD in computational ecology jointly between UCL, the Institute of Zoology, and the RSPB. I have also worked at UNEP-WCMC building automated data handling systems for wildlife trade data, and at the journal Scientific Reports in manuscript peer-review and decisions.

## EDUCATION

**PhD Computational Ecology (Minor corrections) – UCL London NERC DTP** (2017-2021)
Thesis: Causes and consequences of global pollinator biodiversity change in the Anthropocene
- CASE (Collaborative Award in Science and Engineering) PhD in collaboration with UCL (Prof Tim Newbold), the Institute of Zoology (Dr Robin Freeman), and the RSPB (Prof Richard Gregory).
- Taught statistical programming on two computational biology modules, for a total of more than 100 hours, and co-supervised 1 masters student. Covered statistical methods (lme4, anova, lm), programming (basic Python), data handling (piping, dplyr verbs), and functional programming in R.
- Ran online UCL CBER data club sessions during the COVID-19 pandemic (2020-2021).

**MSc Biodiversity and Conservation (Distinction, 1st) – The University of Leeds** (2014-2015)
Thesis: A Satellite Telemetry Investigation of Caspian Seal *(Pusa caspica)* Activity Budgets (77)
- Awarded the second highest overall mark in the year for my data science research project and the highest thesis mark at 80.5%.

**BSc Zoology, Upper second-class honours (2:1) – The University of Leeds** (2011-2014)
Thesis: Of Molecules and Morphology: An Extended Review of the Eutherian Radiation (69)

## EMPLOYMENT

**Leverhulme Early Career Fellow and Bye-Fellow of St Edmund's College – University of Cambridge**
(October 2024-October 2027)
Title: Novel AI and economic mechanisms to solve the biodiversity crisis
- Primary Investigator on a highly prestigious 3 year Fellowship, focussing on the potential future role of ensemble biodiversity models, autonomous spatial finance, and global biodiversity monitoring systems, in solving at least some dimensions of the problems emergent from biodiversity change.
- Core member of the OpenNature Initiative, a consortium of leaders in ecological data science pushing to develop foundational models for ecology, and to develop new funding mechanisms to further the openness of nature data (see https://medium.com/vizzuality-blog/opennature-initiative-its-time-for-accessible-actionable-nature-data-f1ee63864ce3).
- Zoology seminar series organiser (2025 - present); Zoology floor 2 fire warden (2025 - present); postdoc committee member (2025 - present); mock-interviews for 1 postdoc and 1 PhD student; Agroecology Research Group post-doc providing pastoral support and day-to-day leadership for ~10 students and postdocs.

**Visiting Researcher – University of Cambridge** (March-September 2024)
- Funded by the Natural History Museum to join the Agroecology group of Prof Lynn Dicks for a period of 6 months.

**Postdoctoral researcher – the Natural History Museum, London** (March 2022-October 2024)
- Funded on the NERC project GLiTRS (https://glitrs.ceh.ac.uk/), a consortium building global threat-response models for the more robust prediction of insect biodiversity change.
- Lead post-doc on meta-analyses and in combining multiple data types (expert elicitation, space-for-time, and meta-analyses) to develop the core threat-response model for insect biodiversity.
- Supervised 24 students (7 primary supervisor; 17 co-supervisor), led catch-up meetings with groups of masters students and post docs, introduced new starter students to the museum, and NHM-side lead on GLiTRS recruitment during period of line manager absence (hiring one database developer).
- Project lead on the Species Awareness Index (https://doi.org/10.1111/cobi.14096) and Dynameta (https://doi.org/10.1016/j.softx.2023.101439)

**Postdoctoral data scientist and honorary non-stipendiary research fellow – Leverhulme Centre for Demographic Science & Nuffield College, University of Oxford** (September 2021-March 2022)
- Lead on three research projects: 1) a systematic text-analysis review of the causes of human sleep disturbance (including the supervision of 1 student intern); 2) changes in Twitter activity following the COVID-19 pandemic; and 3) the effects of extreme night-time temperature on sleep disturbance, using ERA-5 hourly temperature data and Twitter scraping.
- Helped design a set of data management plans for the collection of multiple forms of publicly donated data (e.g. social media, genetic, genealogy, GPS), and worked with external companies to ensure a secure backend database.
- Co-authored a SAGE Number 10 Cabinet briefing on the reintroduction of COVID-19 preventative measures.

**Programme Assistant – UNEP-WCMC** (September 2016-June 2017)
- Collaborated with Dr Aly Pavitt to develop two new automated systems in R for the processing of CITES data, replacing a previous system built in VBA, and bringing processing time down from 3-4 hours to 5-10 seconds. As of 2025, this platform is still in use almost a decade later.
- Delivered workshops on Shiny to the Species Programme, the wider centre, and a specialist technical GIS hub.
- Involved in producing a data handling guide for the Ecuadorian environmental ministry and an Amazonian regional trade overview, and wrote ~12 trade reviews for the European Commission.

**Publishing Assistant – Nature Publishing Group** (November 2015-September 2016)
- Applied my broad academic knowledge to rapidly assign submitted manuscripts to the editors at Scientific Reports, and then responsible for manuscripts until decisions are made.
- Trained in the handling and identification of clinical trials and responsible for vetting trials before acceptance.
- Responsible for the growth and maintenance of the Ecology and Evolution section of the editorial board.
- Presented accepted ecological papers to the editorial team and wrote paper summaries for our Facebook page, published to more than 100,000 followers.

| MAJOR INVITED TALKS, SYMPOSIA, AND WORKSHOPS |
|---|

2026      **World Conference on Natural Resource Modelling (*upcoming*)**
Invited symposium speaker in a session on quantifying uncertainty in ecosystem and economic models at the World Conference on Natural Resource Modeling (WCNRM) in Stellenbosch, South Africa.

| 2026 | **The COINS 2026** *(upcoming)* |
|---|---|
| | Invited keynote speaker at 'the COINS', a student-led international Life Sciences conference in Vilnius, Lithuania. |

| 2026 | **World Biodiversity Forum** *(upcoming)* |
|---|---|
| | Invited symposium speaker in a session on insect declines at the WBF in Davos. |

| 2026 | **Imperial College seminar (***upcoming***)** |
|---|---|
| | Invited seminar showcasing my fellowship research and how my thinking has been influenced by science-fiction. |

| 2026 | **University of Cambridge** |
|---|---|
| | Invited seminar for Senior Research Fellowship selection in the Department of Zoology. One of four applicants shortlisted for senior fellowships in the Department. |

| 2025 | **Entomological Society of America Portland, Oregon annual meeting** |
|---|---|
| | Symposium co-lead, keynote speaker, and panel session speaker along with Dr Eliza Grames on evidence synthesis for insect biodiversity change meta-analyses, coordinating international efforts for the collation of effect sizes. |

| 2025 | **Shaping the Future of AI for Conservation** |
|---|---|
| | Competitive selection to attend a fully funded week-long workshop in Oxford with fellow early career researchers working on AI in conservation and ecology, including a talk entitled "Autonomous biodiversity credits on the horizon: some thoughts on AI safety and loss of control in conservation" |

| 2025 | **ARIA (Advanced Research and Invention Agency) strategy meeting for ECHO (Ecological Condition & Health Observatory)** |
|---|---|
| | 20 senior-level invite only attendees from across academia, government and industry at ARIA headquarters in London, advising on creating a public-good infrastructure for ecological intelligence**.** ARIA has a remit of £800 million to fund high-risk high-reward research. |

| 2025 | **ARIA (Advanced Research and Invention Agency) strategy meeting for Engineering Ecosystem Resilience Pre-Programme Discovery** *(upcoming)* |
|---|---|
| | Invite only attendees from across academia, government and industry at ARIA headquarters in London, after winning an initial £20,000 Pre-Programme Discovery grant. Attendees will be guiding the investment of £50 million worth of funding across a set of 'Engineering Ecosystem Resilience' streams. |

| 2025 | **University of Durham seminar** |
|---|---|
| | Presented a talk entitled "Navigating computational ecology when you also like science-fiction", showcasing my recent research and how I've been inspired by science-fiction. |

| 2025 | **Royal Society UK-China bilaterial international meeting** |
|---|---|
| | Invite only scientific meeting in Beijing, fully funded by the Royal Society and the Chinese Academy of Sciences for outstanding early career researchers working on biodiversity and the climate. |

| 2025 | **St Edmund's Bye-Fellow inaugural talk** |
|---|---|
| | Delivered a talk at St Edmund's College introducing my research as a new Bye-Fellow. |

| 2025 | **Paul G. Allen Family Foundation funding workshop** |
| | Senior-level invite only meeting at ICCB in Brisbane hosted by Yuta Masuda (Paul G. Allen Family Foundation Director of Science), providing advice on funding strategy. |

| 2025 | **CCI (Cambridge Conservation Initiative) Collaborative Workshop; Food, Agriculture and Biodiversity: emerging agendas** |
| | Invite only workshop planning future work and strategy for the CCI at the intersection of food, agriculture, and biodiversity. |

| 2025 | **Nature Finance CCI workshop** |
| | Invite only workshop planning future nature finance work and strategy in the CCI. |

| 2024 | **University of Cambridge seminar** |
| | Presented a talk entitled "Novel AI and economic mechanisms to help monitor and solve the biodiversity crisis", about my fellowship idea for a central bank digital currency biodiversity credit, combining autonomous remote sensing and a threat-response biodiversity change model. |

| 2024 | **BES Hackathon** |
| | Lead organiser on 'Next-generation monitoring of human-nature interactions' hackathon, including submitting a BES grant proposal and handling all aspects of organisation and logistics. |

| 2024 | **NACCB (North American Congress for Conservation Biology)** |
| | Invited speaker for a symposium entitled "Analysing text data for conservation", including panel member in a closing discussion. |

| 2024 | **Taming complexity in ecology** |
| | 2.5 day invite only workshop in Bad Blankenburg, presenting work from the GLiTRS project combining threat-response models for the more robust prediction of insect biodiversity change. |

| 2024 | **Nature data unlocked** |
| | 2 day invite only workshop in Cambridge on future biodiversity model needs. |

| 2024 | **A conversation with Sir Patrick Vallance (Chair of the Board of Trustees)** |
| | Invited to speak with Sir Patrick Vallance about the biodiversity modelling work of the Natural History Museum and the GLiTRS project. |

| 2023 | **Royal Society Recovering Nature event: building on Georgina Mace's work to ensure a biodiverse and liveable future** |
| | Invited as one of 12 outstanding upcoming biodiversity scientists building on Georgina's work |
| | https://www.youtube.com/watch?v=Np6Ei_KQXIk&list=PLKYTvTbXFuCj0S4IOnfnRqseSE2y3lgzJ&index=11&t=29s&ab_channel=TheRoyalSociety |

| 2023 | **ICCB round-table symposium—Large scale monitoring of perceptions of nature: state of the art and ways forward** |
| | Co-author on accepted proposal along with Diogo Veríssimo on digital monitoring for human-nature interactions (unable to attend in person). |

| 2023 | **NHM & Turing AI Lunch Series** |
| | Invite only lunch for AI scientists working in the natural and environmental sciences at the Natural History Museum in London. |

| 2022 | **Natural History Museum seminar**<br>Presented a talk entitled "Worldwide vulnerability of local pollinator abundance and crop pollination to land-use and climate change", showcasing my early work building models to predict crop pollination risk. |
|---|---|

**2022**      **UCL post-PhD seminar**
Presented a talk entitled "Causes and consequences of global pollinator biodiversity change in the Anthropocene, and some of the inconsequential things that didn't make the cut", an informal seminar describing my research and the experience of doing a PhD.

**2021**      **University of Oxford seminar**
Presented a talk entitled "Pollinators, culturomics, and chronotype: a summary of my background and ideas for future research", showcasing the breadth of my research to date and some initial ideas for the study of predictors of human chronotype.

**2019**      **UCL seminar**
Presented a full seminar as a PhD student, entitled "Text-analysis reveals taxonomic and geographic disparities in animal pollination literature", comprising my first paper and chapter of my PhD.

**2019**      **University of São Paulo (USP) seminar**
Presented a talk entitled "Postgraduate studies in the UK: how, when and why?" at the University of São Paulo (USP) in Brazil, aiming to encourage and help students looking to study in the UK. USP is a highly selective institution and the most prestigious university in South America.

**2019**      **Linnaean Student Conference**
Selected to present my talk entitled "The importance and diversity of animal pollination" at the Linnaean Society, as an outstanding PhD student working in the biodiversity sciences (https://www.youtube.com/watch?v=qn0sCxJiTdI&t=5854s).

---

| AWARDS, GRANTS, AND FELLOWSHIPS (c. £296,342 AS OF OCTOBER 2025) |
|---|

**2025**      **Engineering Ecosystem Resilience Pre-programme discovery grant**
Lead author and conceptualiser on a £20,000 grant entitled "Foundational AI to forecast ecosystem resilience", aiming to carry out two workshops to explore whether and how foundational earth-system models (e.g. TESSERA) and generative agent-based models (e.g. Genie 3) might be combined in the future to forecast ecosystem resilience in digital space.

**2025**      **Elected a Bye-Fellow of St Edmund's College**
Invited to join the college as a Bye-Fellow—typically awarded to permanent academic staff as an honorary position—for an initial period of 1 year, until March 2026.

**2025**      **Royal Society UK-China bilaterial international meeting**
Fully funded by the Royal Society to attend a scientific meeting in Beijing for outstanding early-career researchers, including flights, visa, accommodation, and all additional travel and subsistence expenses (c. £2,000).

**2025**      **Programme Enhancement Fund for Entomology 2025 and contribution from the NSF's Research Coordination Network (RCN)**
Grant awarded for travel and registration (c. £1000).

2024    **Leverhulme Early Career Fellowship**
Highly prestigious 3 year full-time fellowship (c. £171,837). At Cambridge 1-2 prospective Leverhulme Fellows are selected at the Departmental level. Candidates must then be selected by the Isaac Newton Trust for matched funding in a university wide competition, before competing nationally for funding from the Leverhulme Trust. ~100 awards are made annually in the UK across all areas of STEM and the humanities, with ~2-4 per year in ecology and evolution.

2024    **BES hackathon "Next-generation monitoring of human-nature interactions"**
Lead organiser on a BES hackathon, breaking even after receipt of registration income and sponsorship from the journal People and Nature (c. £3,065).

2024    **Masters project funding**
Secured 8 primary supervisions at the Natural History Museum, contributing £1,500 each to the museum (c. £12,000).

2024    **Cambridge University bench fees**
Fully funded to join the University of Cambridge as a visiting researcher in the Agroecology group with Prof Lynn Dicks (c. £1,440).

2024    **Taming complexity in ecology**
Fully funded to attend a workshop on computational methods in ecology in Bad Blankenburg (c. £1,500).

2023    **GEOBON 2023, Montreal**
Fully funded on the NHM Science Investment Fund to travel to Montreal to present work on real-time monitoring for the Species Awareness Index (c. £3,000).

2022    **Capgemini Tech4PositiveFutures challenge**
Finished as one of the top 6 pitches for a €100k prize applying tech to biodiversity problems.

2021    **Elected a non-stipendiary honorary research fellow of Nuffield College**
Invited by Prof Melinda Mills (Director of the Leverhulme Centre for Demographic Science) to join Nuffield College for an initial period of 1 year. Non-stipendiary honorary research fellowships at Nuffield are typically deemed equivalent to a Postdoctoral Prize Research fellowship, awarded to researchers who have the potential to be world-class scholars in the social sciences.

2021    **PhD Conference travel fund**
Grant contribution from UCL towards travel and accommodation for BES Ecology Across Borders in Liverpool (£500).

2020    **BES Quantitative Ecology Hackathon**
Awarded "best presentation" for our plant species identifying AI Shiny app at a BES hackathon (https://methodsblog.com/2020/03/12/quantitative-sig-hackathon/), later published as a dataset on Zenodo (http://dx.doi.org/10.5281/zenodo.3514685).

2019    **Linnaean Student Conference**
Selected as an outstanding PhD student to talk at the Linnaean Society about my work on pollinator biodiversity.

| 2017 | **London NERC PhD studentship** |
|---|---|
| | Fully funded PhD scholarship on the environmental science London NERC DTP, a partnership of 8 prestigious research institutions in London (c. £77,000). |

| 2017 | **CASE (Collaborative Award in Science and Engineering) funding** |
|---|---|
| | Awarded a CASE position in partnership with the RSPB, including an additional PhD fund for my research (c. £3,000) |

| 2015 | **Leeds University Science Magazine Writing competition** |
|---|---|
| | Won first prize in a science writing competition for my piece "The polar bear: a tale of two futures". |

| 2015 | **IEMA Student Sustainability Conference** |
|---|---|
| | Won a committee place for my essay on sustainability issues, and then helped organise a national conference at Leeds whilst a masters student. Later invited to meet Tim Balcon, the former CEO of IEMA. |

## SELECTED MEDIA/OUTREACH

| 2024 | **Visit to Swaffham Bulbeck School for 'Science week'** |
|---|---|
| | Taught 2 groups of school children (year 5/6 and year 3/4) about insect ID and the Natural History Museum's citizen science Nature Overheard programme (https://www.nhm.ac.uk/take-part/monitor-and-encourage-nature/nature-overheard.html) |

| 2023 | **The Telegraph** |
|---|---|
| | National press piece on risks to the production of pollination dependent crops, such as chocolate, via pollinator biodiversity change https://www.telegraph.co.uk/news/2023/10/12/chocolate-under-threat-insects-climate-change-pollinators/ |

| 2023 | **The Independent** |
|---|---|
| | National press piece on risks to the production of pollination dependent crops, such as chocolate, via pollinator biodiversity change: https://www.independent.co.uk/news/ap-scientists-india-science-advances-china-b2428843.html |

| 2023 | **Associated Press** |
|---|---|
| | International press piece in the US on risks to the production of pollination dependent crops, such as chocolate, via pollinator biodiversity change: https://apnews.com/article/pollinators-bees-climate-change-coffee-chocolate-5d92dd9e8a9abb6b5614ad873ce7f24e |

| 2023 | **Number 1 highlighted research at the NHM** |
|---|---|
| | My research was the first piece highlighted by the Natural History Museum in a blog summarising the main research events of the museum that year: https://www.nhm.ac.uk/discover/news/2023/december/museum-published-over-700-new-pieces-of-research-in-2023.html |

| 2023 | **Nature Africa** |
|---|---|
| | Contacted by a science journalist working for Nature Africa, who wrote a piece about my crop pollination risk models for crops in the tropics: https://www.nature.com/articles/d44148-023-00320-y |

2023       **NHM press release (Species Awareness Index)**
Coordinated with the museum press team to produce a press release on my work monitoring changing awareness of biodiversity online: https://www.nhm.ac.uk/discover/news/2023/may/monitoring-changes-in-wikipedia-pageviews-could-help-save-wildlife.html

2023       **Radio France Internationale**
Interviewed by Radio France Internationale on my work on crop pollination risks, particularly with respect to tropical crops such as coffee and chocolate: https://francaisfacile.rfi.fr/en/actualit%C3%A9/20231020-les-insectes-indispensables-%C3%A0-l-agriculture

2021       **UCL press release (land-use climate change interactive effects on pollinators)**
Coordinated with the UCL press team to produce a press release on my paper on crop pollination risks for tropical crops: https://www.ucl.ac.uk/news/2021/may/intensive-agriculture-could-drive-loss-bees-and-other-tropical-pollinators

2021       **UCL press release (Species Awareness Index)**
Coordinated with the UCL press team to produce a press release on my work monitoring changing awareness of biodiversity online: https://www.ucl.ac.uk/news/2021/mar/global-biodiversity-awareness-tracked-wikipedia-page-views

2021       **La Republicca**
International press piece from a national paper in Italy my work monitoring changing awareness of biodiversity online: https://www.repubblica.it/green-and-blue/2021/03/24/news/l_attenzione_alla_biodiversita_vista_dalle_ricerche_su_wikipedia_bene_i_rettili_magli_gli_anfibi-293547661/

2021       **Deutschlandfunk radio**
Interviewed on Deutschlandfunk radio for my work on risks to pollination dependent production via pollinator biodiversity change: https://www.deutschlandfunk.de/insektensterben-in-den-tropen-kaffee-kakao-und-mangos-koennten-knapper-werden-dlf-0b1984c9-100.html

2019       **Planet PhD**
Interviewed for a student podcast, covering my work on pollinator biodiversity change and risks to global crop production: https://open.spotify.com/episode/2GqYS9QE7TRranmck0dryK?si=3PYuQwXEQweZ_cdDPdexPg

## EXPERT PEER-REVIEW

- Journals (x12): Methods in Ecology and Evolution; Conservation Letters; Ecosystem Services; Ecography; Scientific Reports; Global Ecology and Biogeography; Communications Earth & Environment; PLOS ONE; Conservation Biology; Nature Ecology and Evolution; Insect Conservation and Diversity; Nature Reviews Biodiversity
- Grant funding bodies (x1): BBSRC

## TEACHING & SUPERVISION

### Teaching

**2019-21**    **Computational Methods in Biodiversity Research (BIOS0002) & Computational Biology (BIOL0029)**
Demonstrating and marking for a period of ~100 hours across two modules during the period of my PhD at UCL.

### Student supervision

**2025-present**    **Reuben O'Connell Booth**
Co-supervising Reuben on a PhD investigating the effect of agri-environment schemes on insects, along with Lynn Dicks.

**2023-24**    **Lindsey Barnes**
Completed an MPhil at Cambridge co-supervised by me and Andrew Bladon. As a direct result of her work Lindsey is a co-author on my 2025 Diversity and Distributions meta-analytic database, and has her own first author paper accepted in Global Change Biology. Lindsey later received an offer to join the Status of Insects Research Coordination Network in the US as international coordinator for the collation of meta-analytic effect sizes on insect biodiversity change, as a core link between the US and the UK.

**2023-24**    **Emily Wenban-Smith**
Completed an MPhil at Cambridge co-supervised by me and Andrew Bladon. As a direct result of her work Emily is a co-author on my 2025 Diversity and Distributions meta-analytic database, and has her own first author paper in review at Insect Conservation and Diversity. Emily is now a management consultant at Newton.

**2023**    **Wenxuan Yang**
Completed an MRes with me co-supervised with Charlie Outhwaite, assessing the effect of climatic extremes on insect biodiversity.

**2023**    **Shuyue Liu**
Completed an MRes at UCL primary supervised by me, carrying out a meta-analysis on the effects of logging and deforestation on insect biodiversity richness and abundance.

**2023**    **Thomika St Louis**
Completed a NERC research experience placement primary supervised by me, contributing towards the collation of effect sizes. Thomika was an undergraduate at the time, now working for a graduate scheme in sustainable engineering at the consultancy Cudd Bently Consulting.

**2023**    **Wenjie Yi**
Completed an MRes primary supervised by me at UCL, testing the extent to which central bank speeches mention biodiversity, and what predicts this interest.

**2023**    **Jianing Ding**
Completed an MRes co-supervised by me and Tom Frederick Johnson, testing the effect of incorporating spatial autocorrelation terms in models of insect pollinator biodiversity change.

| 2022 | **Grace Skinner** |
|---|---|
| | Completed an MRes at Imperial primary supervised by me at the Natural History Museum. As a direct result of her work, Grace was a first author on a paper introducing her R package for dynamic meta-analysis R (i.e Dynameta, see https://doi.org/10.1016/j.softx.2023.101439). Grace has since carried out a meta-analysis using the framework we introduced, currently accepted at Nature Communications; was a co-author on my 2025 Diversity and Distributions paper as a direct result of her work; and a co-author on my paper warning of risks to pastoral support resulting from ChatGPT. Grace is now a data scientist and part-time PhD student at UKCEH, supervised by Andrew Bladon. |

| 2022 | **Anna Gaw** |
|---|---|
| | Completed a masters at UCL, co-supervised by me and Andy Purvis at the Natural History Museum. Anna is now an 'Endangered Plant Research' technician at the University of Boulder in Colorado. |

| 2022 | **Junghyuk Keum** |
|---|---|
| | Completed an MRes at UCL primary supervised by me at the Natural History Museum. As a direct result of his work, Junghyuk was a co-author on Dynameta, and a co-author on my 2025 Diversity and Distributions meta-analytic database paper. Junghyuk is now a PhD student at UCL, supervised by Tim Newbold. |

| 2022 | **Yeahji Jeong** |
|---|---|
| | Completed an MRes co-supervised by me and Andy Purvis at Imperial using the PREDICTS database. Yeahji is now doing a PhD at QMUL, supervised by Yannick Wurm. |

| 2022 | **Haohao Lei** |
|---|---|
| | Completed an undergraduate internship primary supervised by me at the Leverhulme Centre for Demographic Science, carrying out a review of the drivers of sleep disturbance. Haohao is now doing a DPhil at Nuffield College, University of Oxford. |

| 2021- | **Justin Isip** |
|---|---|
| | Currently completing a PhD jointly between UCL and the Natural History Museum. I have provided significant pastoral and academic support for Justin as an informal co-supervisor. Justin was a co-author on my 2025 Diversity and Distributions meta-analytic database paper for his work collating effect sizes; and a co-author on my paper warning of the effects of ChatGPT on pastoral support in research. |

| 2020 | **Robyn Kinnersley** |
|---|---|
| | Completed an MRes at UCL, co-supervised by me and Tim Newbold. As a direct result of her work, Robyn was a co-author on my 2021 paper in Nature Communications. |

## PUBLICATIONS

### Published (21 in total; 7 first author, 3 last author, 2 joint last author)

Bladon, A., Akite, P., Chowdhury, S., Riva, F., Cooke, R., Dyer, E. E., **Millard, J.**, Outhwaite, C. L., Rodger, J. G., Hui, C., Isip, J. E., Jones, J. I., Murphy, J. F., Newbold, T., Purvis, A., Roy, H. E., Skinner, G., Woodcock B. A., ... Isaac N. J. B., & Dicks, L. V., (2026). Can the Global Biodiversity Framework address insect declines? *Conservation Letters* (submitted on a first round of review)

Skinner, G., Cooke, R., Roy, H. E., Isaac, N. J. B., Outhwaite, C. L., Rodger, J., & **Millard, J.,** (2026). Global meta-analysis reveals overall negative impacts of invasive species on terrestrial insects, despite highly variable responses. *Nature Communications* (accepted)

Barnes, L., Wenban-Smith, Skinner, G., E., Dicks, L., **Millard, J. \*,** & Bladon, A. \*, (2025). Differing impacts of livestock farming and ranching on aquatic insect biodiversity: A global meta-analysis. *Global Change Biology. 31*(9), p.e70513. DOI: https://doi.org/10.1111/gcb.70513. (\* these authors contributed equally to this work)

**Millard, J.**, Skinner, G., Bladon, A. J., Cooke, R., Outhwaite, C. L., Rodger, J. G., Barnes, L. A., Isip, J., Keum, J., Raw, C., Wenban-Smith, E., Dicks, L. V., Hui, C., Jones, J. I., Woodcock, B., Isaac, N. J., & Purvis, A. (2025). A multi-threat meta-analytic database for understanding insect biodiversity change. *Diversity and Distributions*. 31(5), p.e70025. DOI: https://doi.org/10.1111/ddi.70025.

Cooke, R., Outhwaite, C. L., Bladon, A. J., **Millard, J.**, Rodger, J. G., Dong, Z., Dyer, E. E., Edney, S., Murphy, J. F., Dicks, L. V., Hui, C., Jones, J. I., Newbold, T., Purvis, A., Roy, H. E., Woodcock, B. A. & Isaac, N. J. B. (2025). Integrating multiple evidence streams to understand insect biodiversity change. *Science*. 388, no. 6742. DOI: https://doi.org/10.1126/science.adq2110.

Johnson, T.F., **Millard, J.**\*, & Evans, L.C.,\* (2025). More work is needed to identify how people perceive and value nature. *Nature Reviews Biodiversity.* pp.1-2. DOI: https://doi.org/10.1038/s44358-025-00047-8. (\* these authors contributed equally to this work)

Williams, J., Newbold, T., **Millard, J.**, Groner, V., & Pearson, R., (2024). Important pollinators respond less negatively to anthropogenic land use than other animals. *Ecology and Evolution*. 14(11), p.e70486. DOI: https://doi.org/10.1002/ece3.70486.

**Millard, J.,** Christie, A., Dicks, L., Isip, J., Johnson, T.F., Skinner, G., & Spake, R., (2024). ChatGPT is likely reducing opportunity for support, friendship, and learned kindness in research. *Methods in Ecology and Evolution.* 15(10), pp.1764-1766. DOI: https://doi.org/10.1111/2041-210X.14395.

Johnson, T.F., Simmons, B**., Millard, J.,** Strydom, T., Danet A., & Evans, L., (2024). Pressure to publish introduces LLM risks. *Methods in Ecology and Evolution.* 15(10), pp.1771-1773. DOI: https://doi.org/10.1111/2041-210X.14397.

Outhwaite, C.L., Cooke, R., **Millard, J.** & Bladon, A.J., (2024). Pervasive and synergistic effects of climate change. *In Routledge Handbook of Insect Conservation* (pp. 92-107). Routledge. DOI: https://doi.org/10.4324/9781003285793-9

Bladon, A.J., Cooke, R., **Millard, J.** & Outhwaite, C.L., (2024). Practical solutions to climate change for insect conservation. *In Routledge Handbook of Insect Conservation* (pp. 108-118). Routledge. DOI: https://doi.org/10.4324/9781003285793-10

Scheepens, D., **Millard, J.**, Farrell, M., & Newbold, T., (2024). Large language models help facilitate the automated synthesis of information on potential pest controllers. *Methods in Ecology and Evolution.* 15(7), pp.1261-1273. DOI: https://doi.org/10.1111/2041-210X.14341.

Veríssimo, D., Johnson, T.F., **Millard, J.,** & Roll, U., (2023). Adopt digital tools to monitor social dimensions of the global biodiversity framework. *Conservation Letters*. 17(1). DOI: https://doi.org/10.1111/conl.12991.

**Millard, J.**, Outhwaite, C.L., Ceaușu, S., Carvalheiro, L.G., da Silva e Silva, F.D., Dicks, L.V., Ollerton, J. & Newbold, T., (2023). Key tropical crops at risk from pollinator loss due to climate change and land use. *Science Advances*. 9(41), p.eadh0756. DOI: https://doi.org/10.1126/sciadv.adh0756.

Johnson, T.F., Cornford, R., Dove, S., Freeman, R., & **Millard, J.,** (2023). Achieving a real-time online monitoring system for conservation culturomics. *Conservation Biology*. 37(4), p.e14096. DOI: https://doi.org/10.1111/cobi.14096.

Skinner, G., Cooke, R., Keum, J., Purvis, A., Raw, C., Woodcock, B.A., & **Millard, J.,** (2023). Dynameta: A dynamic platform for ecological meta-analyses in R Shiny. *SoftwareX*. 23, p.101439. DOI: https://doi.org/10.1016/j.softx.2023.101439.

Cornford, R.\*, **Millard, J.**\*, González-Suárez, M., Freeman, R., & Johnson, T.F., (2022). Automated synthesis of biodiversity knowledge requires better tools and standardised research output. *Ecography*. 2022(3), p.e06068. DOI: https://doi.org/10.1111/ecog.06068. (\* these authors contributed equally to this work)

**Millard, J.**, Gregory, R.D., Jones, K.E. & Freeman, R., (2021). The species awareness index as a conservation culturomics metric for public biodiversity awareness. *Conservation Biology*. 35(2), pp.472-482. DOI: https://doi.org/10.1111/cobi.13701.

**Millard, J.**, Outhwaite, C.L., Kinnersley, R., Freeman, R., Gregory, R.D., Adedoja, O., Gavini, S., Kioko, E., Kuhlmann, M., Ollerton, J. Ren, Z.X., & Newbold T., (2021). Global effects of land-use intensity on local pollinator biodiversity. *Nature Communications*. 12(1), p.2902. DOI: https://doi.org/10.1038/s41467-021-23228-3.

**Millard, J.**, Freeman, R. & Newbold, T., (2020). Text-analysis reveals taxonomic and geographic disparities in animal pollination literature. *Ecography*. 43(1), pp.44-59. DOI: https://doi.org/10.1111/ecog.04532.

Newbold, T., Adams, G.L. *, Albaladejo Robles, G. *, Boakes, E.H. *, Braga Ferreira, G. *, Chapman, A.S. *, Etard, A. *, Gibb, R. *, **Millard, J. ***, Outhwaite, C.L. * & Williams, J.J. *, (2019). Climate and land-use change homogenise terrestrial biodiversity, with consequences for ecosystem functioning and human well-being. *Emerging Topics in Life Sciences*. 3(2), pp.207-219. DOI: https://doi.org/10.1042/ETLS20180135. (* these authors contributed equally to this work)

**In review (3 in total)**

Smith, K., Newbold, T., **Millard, J.**, Cooke, R., Bladon, A., Purvis, A., Isaac, N., Jones, J.I., Roy, H., Hui, C. & Outhwaite, C.L., 2025. Hidden in the average: Order-specific insect responses to the interaction of land use and climate change. *Diversity and Distributions* (submitted on a first round of review)

Wenban-Smith, E., Barnes, L., **Millard, J.,** Dicks, L., Turner, E,. & Bladon, A., Meta-analysis of extreme temperature effects on the abundance and survival of Hymenoptera and Lepidoptera. *Insect Conservation and Diversity* (submitted on a first round of review)

Dorm, F., **Millard, J.**, Purves, D., Harfoot, M. & Mac Aodha, O., Large language models possess some ecological knowledge, but how much? *Ecological Informatics* (submitted on a first round of review)

**Preprints**

**Millard, J.**, (2023). Mobilising central bank digital currency to bend the curve of biodiversity loss. *EcoEvoRxiv*. DOI: https://doi.org/10.32942/X2TC7H

**Millard, J.**, Akimova, E., Ding, X., Leasure, D., Zhao, B. & Mills, M., (2023). Stringent COVID-19 government restrictions were associated with a marked increase in Twitter activity in Europe. *bioRxiv*. DOI: https://doi.org/10.31235/osf.io/g9apk

**In prep**

Cooke, R., Outhwaite, C., Bladon, A., **Millard, J.**, Rodger, J., Dong, Z., Dyer E., Edney, S., Murphy, J., Dicks, L., Hui, C., Jones, I., Newbold, T., Purvis, A., Roy, H., Woodcock, B., & Isaac, N. J. B. Insect Time Series (IN-TIME), a database of worldwide insect trends

Outhwaite, C., Purvis A., Newbold, T., Bladon, A., Cooke, R., **Millard, J.,** Dicks L., Isaac, N., The response of Hymenopteran (Bees, Wasps & Ants) biodiversity to a changing world

**Millard, J.**, Varah, A., Isip, J., Tudge, S., Contu, S., Burton, V., Johnson, T., Purvis, A., De Palma, A., Predictions of biodiversity change are question dependent

**Millard, J.**, Dicks, L. V., Autonomous biodiversity credits on the horizon.

**Millard, J.**, Cooke, R., Outhwaite, C. L., Bladon, A. J. , Rodger, J. G., F., Hui, C., Newbold, T., Purvis, A., Woodcock, B. A. & Isaac, N. J. B., Dicks, L. V., Compounded uncertainty of ecosystem service risk under environmental change