

Sara Lil Middleton

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EDUCATION

DPhil in Environmental Research, St Cross College, University of Oxford (2018-present)
A DPhil programme funded by the NERC-Oxford DTP in Environmental Research.

MRes Ecosystems & Environmental Change (Distinction 78%), Imperial College London (2016-2017)
MRes course with ten weeks of modules, including Ecology and Global Change, Science and Policy, Biodiversity and Geographical Information Systems, followed by a nine-month research project and science communication/policy written coursework based on the research project.

BSc Environmental Sciences (First Class Honours 78%), Oxford Brookes University (2012-2015)
I undertook a wide range of modules, including: Advanced Topics in Wildlife Conservation, Plant Science, Threatened Species, Environmental Processes, Pollution and Climate Change, Environmental Change: Fieldwork and Research. **Lab work:** Sediment analysis (particle size analysis, magnetic susceptibility, pH/conductivity) chemical titrations; flower and pollen analyses (SEM and optical microscope). **Fieldwork:** Plant and insect identification, Phase 1 and 2 surveying, quadrat sampling, freshwater and terrestrial invertebrates in Oxfordshire; Devon; Cevennes National Park, France.

RESEARCH EXPERIENCE

DPhil Project (January 2019 – present)
Supervised by Prof Andy Hector “Towards building cross-disciplinary bridges in trait-based research: theory and practice”. **Methods:** climate manipulation, plant identification, systematic mapping and multivariate analysis. **Analysis:** R, Python

Plant Diversity in Banana Production Systems (February – March 2018)
Measuring herbaceous plant species diversity in different banana production systems in Costa Rica. **Methods:** designing botanical surveys, plant identification. Data will contribute to the PREDICTS project based at Natural History Museum, London.

MRes Research Project (79%) (January – September 2017)
Supervised by Prof. Colin Prentice and Dr Henry Ford “Which traits determine the success of plant invaders? A multivariate analysis of the flora of the United Kingdom”. The project involved using the Ecoflora trait database, current and future UK climate scenarios and species distribution data. **Methods:** database queries, data cleaning, data table creation, climate data formatting using SPLASH algorithms, multivariate analysis. **Analysis:** MySQL, Panoply, Python, QGIS and R.

Environmental Consultancy (November 2014 – April 2015)
I worked in a small team, with the aim of providing a palaeoenvironmental reconstruction of the Phuthiatsana River valley, Lesotho. **Methods:** proposal writing, sediment and multivariate analyses, report writing and presenting the findings to the client. **Analysis:** R. This work contributed to the Metolong Cultural Resource Management Project.

BSc Final Year Research Project (79%) (June 2014 – March 2015)
Supervised by Dr Andrew Lack “An assessment of the distribution of lupins (*Lupinus nootkatenis*) and the effect on native flora in Thorsmork, southern Iceland”. The project involved extensive research on the topic, a month of fieldwork (June-July 2014) in southern Iceland, supervising a group of volunteers in the management of lupins, an invasive species, reporting the findings to the Icelandic Soil Conservation Service and the Icelandic Institute of Natural History. **Methods:** fieldwork design, GPS mapping, quadrat sampling, plant identification, multivariate analysis. **Analysis:** ArcGIS, Google Earth, R.

GRANTS AND FUNDING

• BIPOC STEM Network, University of Oxford, 2020	£2000
• Behaviour Ecology and Evolution conference, University of Oxford, various funders, 2020	£2935
• Bananageddon: Change the System, Change the Story, Kick Starter funding campaign, 2019	\$7208
• Imperial Expedition to Costa Rica: The Bananageddon Film, Imperial College London, 2017	£4900
• Oxfordshire Community Scholarship, 2012-2015	£2000

PRIZES, AWARDS AND RECOGNITIONS

• Oxford DTC Contribution to EEDI Prize: Recognition of excellence for BIPOC STEM Network	(2022)
• Oxford University MPLS EDI Awards: Best Initiative for the BIPOC STEM Network	(2021)
• The Oxford Black History Month 100 List (featured)	(2020)
• IAVS Young Scientist Oral Presentation Award (Honorable Mention)	(2019)
• Photo essay winner of the Silwood Park Photography Competition	(2017)
• Dan Hemingway (Art) Prize for Creativity, for my large-scale drawings	(2010)

PUBLICATIONS

Peer reviewed:

- **Middleton, S. L.** Automating image segmentation for vegetation monitoring. *Nat Rev Earth Environ.* (2023) DOI:10.1038/s43017-023-00466-1
- Parsons, S., Azevedo, F., Elsherif, M. M. M., Guay, S., Shahim, O. N., Govaart, G. H., Norris, E., O'Mahony, A., Parker, A. J., Todorovic, A., Pennington, C. R., Garcia-Pelegrin, E., Lazí c, A., Robert-son, O. M., **Middleton, S. L.**, Valentini, B., McCuaig, J., Baker, B. J. ... & Aczel, B. (2022). A Community-Sourced Glossary of Open Scholarship Terms. *Nat Hum Behav.* DOI:10.1038/s41562-021-01269-4
- Rudd Lauren F., Allred Shorna, Bright Ross Julius G., Hare Darragh, Nkomo Merlyn Nomusa, Shanker Kartik, Allen Tanesha, Biggs Duan, Dickman Amy, Dunaway Michael, Ghosh Ritwick, González Nicole Thompson, Kepe Thembele, Mbizah Moreangels M., **Middleton Sara L.**, Oommen Meera Anna, Paudel Kumar, Sillero-Zubiri Claudio and Dávalos Andrea (2021). Overcoming racism in the twin spheres of conservation science and practice. *Proc. R. Soc. B.* DOI: 10.1098/rspb.2021.1871
- Chacón Labella, J., Boakye, M., Enquist, B. J., Farfan-Rios, W., Gya, R., Halbritter, A. H., **Middleton, S. L.**, von Oppen J., Pastor-Ploskonka, S., Strydom, T., Vandvik, V., Geange, S. R. (2021). From a crisis to an opportunity: Eight insights for doing science in the Covid-19 era and beyond. *Ecology and Evolution* DOI: 10.1002/ece3.7026
- Geange, S. R., von Oppen J., Strydom, T., Boakye, M., Gauthier, T. J., Gya, R., Halbritter, A. H., Jessup, L. H. **Middleton, S. L.**, Navarro, J., Pierfederici, M. E., Chacón-Labella, J., Cotner, S. Farfan-Rios, W., Maitner, B. S., Michaletz, S. T., Telford, R. J., Enquist, B. J., Vandvik, V. (2021) Next generation field courses: integrating Open Science and online learning. *Ecology and Evolution* DOI: 10.1002/ece3.7009

Preprints

- Jackson, J., **Middleton, S. L.**, Lawson, C. S., Jardine, E., Hawes, N., Maseyk, K., Salguero-Gomez, R., Hector, A. (2023, July 11). Experimental drought reduces the productivity and stability of a recovering calcareous grassland. Retrieved from DOI: <https://doi.org/10.1101/2023.07.11.548537>
- Elsherif, M. M., **Middleton, S. L.**, Phan, J. M., Azevedo, F., Iley, B. J., Grose-Hodge, M., ... Dokovova, M. Bridging Neurodiversity and Open Scholarship: How Shared Values Can Guide Best Practices for Research Integrity, Social Justice, and Principled Education. DOI: 10.31222/osf.io/k7a9p

Museums and exhibitions

- Article: *Beyond a green carpet* for the Wellcome Collection Rooted Beings exhibition (August 2022)
- Researcher response to Kurt Jackson's Biodiversity Exhibition, Natural History Museum, Oxford (February-May 2022)

Magazines

- F Azevedo, **S Middleton**, J M. Phan, S Kapp, A Gourdon-Kanhukamwe, B Iley, M Elsherif, & J J. Shaw. Navigating Academia as Neurodivergent Researchers: Promoting Neurodiversity Within Open Scholarship. *APS Observer* October 2022
- **Middleton, S. L.** Decolonising ecology: unearthing the contribution of Black British naturalists. *British Ecological Society Niche Magazine* September 2020
- **Middleton, S. L.** Bananas! Peeling back the history, biology and future of the world's favourite fruit. *British Ecological Society Niche Magazine* December 2019

Blogs and interviews

- Navigating Open scholarship for neurodivergent researchers: Introducing the Neurodiversity group at FORRT (March 2022)
- Interview for Disability Pride Month at *Communications Biology* doi.org/10.1038/s42003-021-02411-8 (July 2021)
- von Oppen, J., Gya, R., Geange, S., Strydom, T., **Middleton, S.** & Maitner, B. Next Generation Field Courses: Enhancing ECR Development Through Open Science and Online Learning. *EcoMass* (March 2021)
- **Middleton, S. L.** Towards an open and reproducible research culture: an ECR perspective. *SalGo Team Blog* (December 2020)
- **Middleton, S. L.** What is an individual?: Why bees, mushrooms and grasses complicate the picture of what it means to be an individual. *Evidently Scientific* (August 2020)
- Interview with Fronds with Benefits: Making the grass greener with Sara Middleton (July 2020)
- **Middleton, S. L.** Bananageddon: Is banana apocalypse 2.0 upon us? *Evidently Scientific* (April 2019)

SYMPOsia AND WORKSHOPS

- **Open Science Community Groningen Event** (June 2023)
Facilitator, University of Groningen
- **Behaviour Ecology and Evolution (BEE) student conference** (April 2021)
Co-organiser and social media and outreach coordinator, University of Oxford
- **Trait-based Ecology Workshop** (June 2019)
Chief organiser, Department of Plant Science, University of Oxford
- **Science, Ethics & Exploitation: the things we do in the name of science** (June 2019)
Co-organiser, University of Oxford
- **Balancing Sustainability and Development: Cities in the 21st Century** (August 2017)
Chief organiser and chair, Imperial College London, South Kensington.

CONFERENCES

- Botanical Society of America, Virtual (27-31 July 2020)
- World of Fresh Ideas, Fruit Logistica Trade Fair, Berlin, Germany (4-5 February 2020)
- British Ecological Society annual meeting, Belfast, Northern Ireland (10-13 December 2019)
- The Big Botany Challenge: Promoting passion for plants in our schools, Reading (8 November 2019)
- International Association of Vegetation Science annual symposium, Bremen (14-19 July 2019)
- Connecting research, management & policy, BES Invasion Science SIG, London (1-2 November 2019)
- Securing Our Natural Environment for Future Generations, British Ecological Society/UK Conservation Agencies Symposium, Manchester (23-24 May 2018)
- Third Conference of the World Banana Forum, FAO, Geneva (7-10 November 2017)
- Climate Visuals Masterclass, Climate Outreach, London (4 September 2017)
- The Macroecology of Alien Species: Patterns, Drivers and Consequences of Global Biotic Exchange, BES, Durham (24-26 July 2017)

PRESENTATIONS

Presentations are talks unless denoted with * in which case they are poster presentations, I*= invited talk

- **Middleton, S.** *Plants and people: finding the roots of community across the tree of life.* I*
Kew Mutual Improvement Society, London (27 February 2023)
- **Middleton, S.** *RainDrop drought experiment: who are the plant winners and losers in the battle for water?*
I* Wytham talks, University of Oxford (18 February 2022)
- **Middleton, S.** *Beyond a green carpet: The importance of grasslands in the era of climate breakdown* I*
South London Botanical Institute (17 November 2021)
- **Middleton, S.** *Plant Traits: Theory & Practice* I* Karlsruhe Institute of Technology, Germany (22 July 2021)
- **Middleton, S.** *Plants, People and Place: A Conversation about Conservation* I* Oxford University
Conservation Society (25 February 2021)
- **Middleton, S.** Panelist on the Student Botany Luncheon, I* Botany 2020 (BSA) (27 July 2020)
- **Middleton, S.,** Salguero-Gómez, R. and Hector, A. *Plant soap operas: who will win and who will lose in the battle for water?* I* NERC CEO in Oxford meeting, Oxford (12 February 2020)
- Turner, J., **Middleton, S.,** Gupta M., Dunn, N. *Bananageddon.* I* World of Fresh Ideas, Fruit Logistica, Berlin, Germany (4-5 February 2020)
- **Middleton, S.,** Salguero-Gómez, R. and Hector, A. *When are plant traits “functional”? A demographic perspective.* BES, Belfast, Northern Ireland (10-13 December 2019)
- **Middleton, S.,** Salguero-Gómez, R. and Hector, A. *When are traits “functional”? A demographic perspective.* IAVS, Bremen, Germany (15-19 July 2019)
- **Middleton, S.,** Salguero-Gómez, R. and Hector, A. *Are functional traits a shortcut to understanding plant communities under global change?* Oxford DTP Summer School, Oxford. (12 July 2019)
- **Middleton, S.,** Prentice, I. C. and Ford, H. *Looking across the invasion continuum, what functional traits determine successful plant invaders?* * Connecting research, management and policy, British Ecological Society Invasion Science SIG, London (1-2 November 2018)

MENTORING, DEMONSTRATING AND TEACHING

Postgraduate

Organising a weekly seminar for new NERC DTP students (2019-2020)

Undergraduate

Orientation of field experiments and decolonising biology 1st year MBiol students (October 2020)

Biodiversity practical (plant and insect ID) 2nd year BA Bio students (October 2019)

ACADEMIC SERVICE

University of Oxford (MPLS Division) (May 2022)

Neurodiversity training for PIs workshop convener

University of Oxford Public Engagement with Research Seed Fund (November 2021)

Funding panel member

Reproducible Research Oxford (RRox) (January 2021 – present)

Steering group and divisional representative

University of Oxford (June 2020 – May 2022)

Equality and diversity consultant and cofounder of the BIPOC STEM Network

EMPLOYMENT AND WORK EXPERIENCE

Forestry Journal/Institute of Chartered Foresters (August 2021 – present)

Social Media Editor

Black British Biology Project (September 2020 – present)

Founder

Human Nature Stories Project (October 2017 – present)

Founder

Bananageddon Documentary Film Project (February 2017 – present)

Project coordinator

Ecological Flora of the British Isles (Ecoflora) (December 2017 – December 2020)

Volunteer data analyst

SKILLS

Computer skills: Knowledge and experience of Microsoft Office (Word, Excel, PowerPoint), Canva, Image J, MySQL, Python and R

Other skills/certifications: Full UK driver's license, Level 2 fieldwork first aid, DBS certified

Languages: Bilingual in English and Italian, conversational Portuguese, French and Spanish

ACTIVITIES AND INTERESTS

Memberships:

- Front and Center Plant Science (January 2023 - present)
- FORRT: *Framework for Open and Reproducible Research Training* (January 2022 – present)
- British Ecological Society REED Ecologist Network (October 2020 – present)
- Botanical Society of America (July 2020 – present)
- International Association for Vegetation Science Young Scientists (July 2019 – present)
- International Association for Vegetation Science (May 2019 – present)
- Ecological Society of America (February 2019 – present)
- Botanical Society of Britain and Ireland (December 2017 – present)
- British Ecological Society (October 2016 – present)

Courses:

- Plant functional trait course 5, Wayquecha, Peru (8-23 March 2020)
- Meta-analysis in Biology and Environmental Sciences, University of Gothenburg, Tjörn, Sweden (20-25 October 2019)
- Functional trait course, Porquerolles Islands, France (20-24 May 2019)
- R 4 All, Department of Zoology, University of Oxford (25-29 March 2019)
- R for Biologists, Department of Zoology, University of Oxford (Feb-March 2019)
- NERC ATSC: Stage-based demographic models in ecology, evolution and conservation biology, Pembroke College, University of Oxford (7-11 January 2019)

Outreach activities:

- Plant detectives! A botanical activity on plant indicators with South London Botanical Institute with sixth form students, London (March 2023)
- Botanical and climate change talk with environmental summer school students, Wytham Woods, Oxfordshire (July 2022)
- Oxford Teach Green, an Oxford University student organisation providing environmental education to local primary schools (January – June 2015)

Science communication:

I have written, given talks, produced videos and been interviewed on podcasts for a number of organisations (e.g. The Wildlife Trusts, Oxford University Conservation Society, Wellcome Collection, Kew Gardens, Evidently Scientific blog, Women in Ecology and Evolution podcast) on topics such as plant biology, wildflowers, agriculture, conservation and human-nature relationships.

Other interests:

Hiking, surfing, knitting, baking, nature photography and Korfbal