Amber Cowans CV

I am a quantitative ecologist, interested in developing and applying scalable and efficient monitoring methods in ecology.

Research Interests

Statistical ecology · Machine learning for wildlife monitoring · Passive acoustic monitoring · Camera trap data · Human–wildlife interactions · Social–ecological systems · Conservation technology

Education

- **PhD in Statistics (NERC Doctoral Training Partnership)**
  University of St Andrews, Department of Mathematics & Statistics (CREEM), 2022–2026 (expected)
  Research focus: Statistical and machine learning methods to quantify ecological impacts of outdoor recreation in the Cairngorms National Park.
  Developed AI-assisted workflows for efficient species identification and robust ecological inference.
  Managed >£30k research budget across multiple partners (RSPB, FLS, NatureScot, Wildlands).
- **MSc in Statistical Ecology** (Distinction, GPA 18.3/20 – top in cohort)
  University of St Andrews, 2021–2022
  Funded by competitive Statistical Ecology Scholarship.
  Thesis: Multispecies occupancy modelling of carnivore distributions in South African reserves.
- **BA in Biological Sciences (1st Class Honours)**
  University of Oxford, 2017–2020

Publications

Peer-Reviewed Articles

- Cowans, A., Lambin, X., Hare, D., & Sutherland, C. (2024). *Improving the integration of artificial intelligence into existing ecological inference workflows.* **Methods in Ecology and Evolution.**
- Cowans, A., Bonet-Bigata, A., & Sutherland, C. (2025). *Sample size considerations for species co-occurrence models.* **Ecology.**

Technical Reports

- Sutherland, C., Cowans, A., Reilly, H., Lamont, W. (2025). *Towards transparent reporting of deer cull targets in Scotland – the Deer Population Projection Tool.* NatureScot.

📣 Conferences & Invited Talks

Invited Speaker Presentations

- International Wildlife Congress, Norway (Sep 2025) – *"Using modern technology to understand spatial and temporal responses of large mammals and birds to human recreation in Scotland"*
- Chartered Institute for Ecology and Environmental Management (CIEEM) "Embracing the AI Revolution in Ecology and Environmental Management", Online (Jul 2025, 100+ people) – *"From Sensors to Inference: A Framework for Integrating AI into Ecological Monitoring of Human–Wildlife Interactions"*
- Journées des Jeunes BioAcousticien (JJBA), France (Jun 2025, ~80 people) – *"Using Passive Acoustic Monitoring and AI to Explore Responses of Forest Birds to Human Recreation in Scotland"*
- Pint of Science, St Andrews (May 2025, ~50 people) – *"Studying Animals Using AI: How technology helps us spy on wildlife"*
- University of Aberdeen guest lecture in Wildlife Conservation module (Feb 2025, ~20 people) – *"How do birds and large mammals respond to human recreation in Scotland?"*
- British Ecological Society (BES), Liverpool (Dec 2024, ~100 people) – *"Aligning sensor data, artificial intelligence and statistical methods in ecology"* (poster presentation)
- Cairngorms Connect Conference, Aviemore (Sep 2024, ~30–40 people) – *"Using technology to understand how vertebrates respond to human recreation"*
- International Statistical Ecology Conference (ISEC), Swansea (Jul 2024, ~100 people) – *"Sample size considerations for estimating species co-occurrence with multispecies occupancy models"*
- WildScotland, Aberdeen (May 2024, ~50 people) – *"Contextualising the ecological impacts of recreation in a social-ecological systems framework"*
- Student Conference in Conservation Science, Cambridge (Mar 2024, ~100 people) – *"Machine learning methods help quantify spatial responses of birds to human recreation"*
- Conservation Carpathia, Romania (Oct 2024, ~15 people) – *"Recreation and non-lethal predation effects in Cairngorms Connect"*
- British Ecological Society (BES) Annual Science Meeting, Belfast (Dec 2023, ~100 people) – *"Can we trust the robots? Using AI tools to explore responses of forest birds to human recreation"* (poster presentation)
- Marine Alliance of Science and Technology Annual Science Meeting; Artificial Intelligence Special Session, Glasgow (Dec 2023, ~100 people) – *"Machine learning methods help quantify spatial responses of birds to human recreation"*

Research & Project Experience

- **Research Assistant – Beaver Team, NatureScot** (Jul 2025 – Present, Scotland, United Kingdom)
  Contract statistician developing spatio-temporal modelling approaches to estimate the number of beaver territories in Scotland and providing recommendations to improve the efficiency of national surveys.
- **Research Assistant – Deer Policy Team, NatureScot** (Feb 2024 – Jul 2024, Scotland, United Kingdom)
  Helped develop the Deer Population Projection Tool , a free tool to help deer managers with cull planning. The tool allows managers to generate population projections under different management strategies and automatically construct reports.
- **PhD Researcher – University of St Andrews & Cairngorms Connect** (2022–Present)
  Designed and led a multi-year, landscape-scale study using >100 camera traps and ARUs across 600 km².
  Developed "AI-Spy", a human-in-the-loop workflow improving labelling efficiency by 90%, now used by RSPB and Saving Wildcats.
  Coordinated collaboration across four major landowners and interdisciplinary supervisors.
- **Assistant Conservation Biologist & Communications Officer – Lion Landscapes** (2020–2021)
  Built a lion ID and GPS database for cross-landscape monitoring.
  Trained AI model for individual recognition.
  Produced media and reports for fundraising and outreach.
- **Field & Research Assistant – WildCRU, ZSL, MCS, Cornwall Wildlife Trust** (2017–2021)
  Conducted extensive fieldwork on mammals and intertidal biodiversity.
  Supported analytical projects on camera trap density estimation and small mammal monitoring.

Teaching & Supervision

- **University of St Andrews (Mathematics & Statistics)** – 2022–present
  Lead Demonstrator: Applied Statistical Modelling with GLMs, Advanced Data Analysis.
  Supervisor: 3 undergraduate + 1 MSc dissertation project.
- **University of St Andrews (Biology)** – 2024–2026
  Lead Demonstrator: Population Biology (mark–recapture methods).
  Guest Lecturer: Case Studies in Conservation, University of Aberdeen (2025).
- **Workshops (Lead Instructor)**
  Applied Hierarchical Modelling in Ecology (Lajuma, South Africa, 2025).
  Introduction to R for Ecologists (Lajuma, South Africa, 2025).
  Hierarchical Modelling of Species Distributions (IWC, Norway, 2025).

Formal Training

- **"Shaping the Future of AI for Conservation" Workshop** – University of Oxford (Sep 2025)
  Participated as part of the *Foundation Models Team*, exploring large-scale AI applications for biodiversity and conservation.
- **Python and Earth Observation (Google Earth Engine)** – NERC, SENSE Centre for Satellite Data in Environmental Science, Edinburgh (2023)
- **Scottish Mathematical Sciences Training Centre (SMSTC)** – Regression and Simulation Methods, Modern Regression and Bayesian Methods (2022–2023)
- **Academy for PhD Training in Statistics (APTS)** – Statistical Modelling, Applied Stochastic Processes, Statistical Machine Learning, and Causal Inference (2022–2023)
- **Project Management for Wildlife Conservation** – WildTeam (2020)

Technical Skills

Statistical modelling · Machine learning · R · Python · AI-assisted image classification · Passive acoustic monitoring · GIS (R, ArcMap) · Database management · LaTeX · Report writing · Public speaking

Awards, Grants & Fellowships

- Global Challenges Research Fund (GCRF) Project: "Long-term quantitative capacity building to monitor Southern Africa's biodiversity and facilitate human–wildlife coexistence" (2024)
- Kaleidoscope Pro Grant, Wildlife Acoustics (2023)
- Steve Buckland Statistical Ecology Prize, University of St Andrews (2022)
- Statistical Ecology Scholarship, University of St Andrews (2022)
- Academic Scholarship, University of Oxford (2019)
- Research Budget Management: >£30,000 (FLS, NERC, RSTG, TSG, GCRF)

Outreach & Science Communication

- Amber Cowans (CREEM): using recorders and AI to assess the impact of walkers on the vocal activity of Scottish forest birds — *Ornithomedia* interview (2025)
- BBC Reporting Scotland (2023): Interviewed for "Voles counted to protect Scotland's endangered birds."
- University of St Andrews SAEC Program (2023): How Statistics Can Save the Planet.
- Pint of Science Festival (2025): Studying Animals Using AI.
- Citizen Science Coordinator: Cairngorms Connect MammalWeb Project .

Professional Activities

- Reviewer: Wildlife Biology, People & Nature, PLOS ONE, European Journal of Wildlife Research, Animal Biodiversity & Conservation
- Member: British Ecological Society (BES), Society for Conservation Biology (SCB)
- Event Organiser: The Burn 2025 (Mathematics & Statistics Retreat, St Andrews)
- Captain, St Andrews University Surf Team (2023–2024)

References

- **Dr. Chris Sutherland** – Reader in Statistics, University of St Andrews
  css6@st-andrews.ac.uk
- **Prof. Xavier Lambin** – Professor of Ecology, University of Aberdeen
  x.lambin@abdn.ac.uk
- **Dr. Darragh Hare** – Research Fellow, University of Oxford
  darragh.hare@biology.ox.ac.uk
- **Kenny Kortland** – Environment Policy Advisor, Scottish Forestry
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