

Bethany R. Smith



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Education

- **PhD**, Nottingham Trent University (NTU), UK 2020 – present
- **MRes Ecology, Evolution & Conservation**, Imperial College London, UK – **Distinction** 2017 – 2018
- **BA Natural Sciences (Zoology)**, University of Cambridge, UK – **First** 2013 - 2016

Awards & Funding

- **Best Student Poster** - Mammal Society Spring Conference (2021) - “How might Livestock Guarding Dogs (LGDs) affect Wildlife?” ([view here](#)).
- **\$15000** Christine Stevens Wildlife Award (2019) - “Passive monitoring of wild wolves using acoustic detectors”.

University Research Projects

PhD: The ecological effects of livestock guarding dogs used as large carnivore deterrents 2020 – present

- Investigating how livestock guarding dogs (LGDs) interact with and affect co-occurring wildlife, particularly grey wolves and brown bears, in the Romanian Carpathian Mountains in collaboration with Fauna & Flora International (FFI).
- Methods employed: semi-structured **interviews** with shepherds; morphological **scat analysis** (including microscopic hair identification); animal behaviour observations from animal-borne video cameras; **GPS tracking** of LGDs and livestock followed by home range analyses and hidden Markov modelling to infer behavioural states; and **camera trapping** of wildlife followed by multispecies occupancy and activity pattern analyses. All analyses conducted in R and QGIS.
- One [paper](#) published with four more expected post thesis submission.
- Anticipated thesis submission: May 2023.
- *Supervisors: Drs Antonio Uzal (NTU), Richard Yarnell (NTU), Katherine Whitehouse-Tedd, and Iain Trewby (FFI).*

Master’s Project 1 (Distinction – 74%): eDNA survey development for water voles and American mink 2018

- Worked with stakeholders including an ecological consultancy firm and several wildlife conservation NGOs to successfully design an eDNA survey to detect water voles and American mink from water samples.
- Designed primers and probes for species-specific qPCR in Geneious and tested their specificity and performance at detecting only the target species.
- *Supervisor: Professor Vincent Savolainen (Imperial College London).*

Master’s Project 2 (Distinction – 79%): Temporal responses of brown bears to human activity 2018

- Managed and analysed >500,000 camera trap photos using Camelot, R, and QGIS to investigate the temporal responses of brown bears to tourists in the Plitvice Lakes National Park, Croatia. Publication in prep.
- Gained experience in setting and checking bear and lynx traps and in radio-tracking of GPS-collared individuals from the ground and from a plane.
- *Supervisors: Professor Josip Kusak (University of Zagreb) & Dr Marcus Rowcliffe (Zoological Society of London).*

Undergraduate Project (First – 70%): Freshwater mussels as ecosystem engineers 2016

- Placed freshwater mussels into sediments of different organic matter percentages and recorded the changes in sediment chemistry, benthic algae, zooplankton communities, and mussel growth. Published [paper](#).
- *Supervisors: Dr Andrew Tanentzap & Dr David Aldridge (University of Cambridge).*

Additional Research / Work Experience

Passive acoustic monitoring of wildlife with the Canid Howl Project (*International*) 2015 – present

- Part of an international team developing low-cost acoustic recorders to facilitate large-scale monitoring of vocal wildlife with a focus on acoustic localisation and automatic detection, to aid wildlife conservation efforts.
- Current focal species include: grey wolves, coyotes, golden jackals, domestic dogs, and Cao vit gibbons.
- Collected and analysed acoustic data from captive wolves to investigate the characteristics of howls from different subspecies of wolves. Secured funding to host a workshop in July 2023 on automatic detection of wildlife species in audio recordings.

Student Officer – Mammal Society (*UK*) 2019 – present

- Created and maintain Student Research Hub on the Mammal Society website, including proof-reading and editing Student Spotlight blogs and writing content for Mammal News, the society's members' magazine.
- Co-ordinate the University Mammal Challenge encouraging students to interact with nature and collate the data provided from the teams each month.
- Co-supervise student research projects undertaken in collaboration with the Mammal Society.

Data & Information Officer - Mammal Society (*UK*) 2018 – 2019

- Wrote large sections of the RMarkdown and Shiny code in R that underpins [EcoBat](#) - the society's web tool for automated bat activity analysis - and maintained its functioning.
- Provided editorial support for the 'Atlas of the Mammals of Great Britain and Northern Ireland' and published two research papers on hedgehog behaviour and UK mammal occupancy trends. For the latter, I developed a Shiny app to visualise these trends: <https://mammalsociety.shinyapps.io/OccupanyTrends/>.
- Co-ordinated several UK-wide research projects including the use of the Mammal Mapper app, standardised small mammal trapping to estimate population densities, and a citizen science project to survey waterways.

Research Assistant, Ives Lab - University of Wisconsin-Madison (*Iceland*) 2017

- Assisted on a long term ecological research project investigating population dynamics of midges and subsequent impacts on the surrounding aquatic and terrestrial communities of midge population fluctuations.
- Took sediment cores and water samples from several lakes across northeast Iceland and sampled the terrestrial food web.

Research Intern – Lupus Laetus (*Finland*) 2016

- Spent 2 months snow-tracking wolves, lynx, and wolverines for up to 10-15km per day and mapping GPS tracks.
- Collected and processed wolf and lynx scats.

Field Assistant, Tanenzap Lab - University of Cambridge (*Canada*) 2015 & 2016

- Established and routinely sampled mesocosms in three different lakes as part of a large-scale restoration project at the Vale Living with Lakes Centre in Sudbury, Ontario, Canada.
- Took samples of water, sediment, macroinvertebrates, phytoplankton, and zooplankton and then ran analyses in the laboratory using specialist equipment (e.g. TOC analyser, gas chromatograph, HACH spectrophotometer).

Publications

- Rigoudy, N. et al. (*Under review*). The DeepFaune initiative: a collaborative effort towards the automatic identification of French fauna in camera-trap images. *Mammal Review*.
- Bru, E., **Smith, B.R.** et al. (2023). Combining acoustic multilateration and high-resolution land cover maps to study predator vocalisation behaviour. *Wildlife Research*. <https://doi.org/10.1071/WR22007>.
- Smith, B.R.** et al. (2021). Acoustic localisation of wildlife with low-cost equipment: lower sensitivity, but no loss of precision. *Wildlife Research*. <https://doi.org/10.1071/WR21089>.
- Coomber, F.G., **Smith, B.R.** et al. (2021). Using biological records to infer long-term occupancy trends of mammals in the UK. *Biological Conservation*. <https://doi.org/10.1016/j.biocon.2021.109362>.

- Smith, B.R.** et al. (2020). The ecological effects of livestock guarding dogs (LGDs) on target and non-target wildlife. *Journal of Vertebrate Biology*. <https://doi.org/10.25225/jvb.20103>.
- Mathews, F., **Smith, B.R.** et al. (2020). *The State of Mammals in Wales*. A report by the Mammal Society for Natural Resources Wales, produced in association with Wales Mammal Biodiversity Action Forum. The Mammal Society, London. ISBN: 978-0-9935673-6-0.
- Finch, D., **Smith, B.R.** et al. (2020). Effects of Artificial Light at Night (ALAN) on European Hedgehog Activity at Supplementary Feeding Stations. *Animals*. <https://doi.org/10.3390/ani10050768>.
- Crawley, D., Coomber, F., Kubasiewicz, L., Harrower, C., Evans, P., Waggitt, J., **Smith, B.R.** and Matthews, F. eds. (2020). *Atlas of the Mammals of Great Britain and Northern Ireland*. Pelagic Publishing Ltd.
- Tanentzap, A.J. and **Smith, B.R.** (2018). Unintentional rewilding: lessons for trophic rewilding from other forms of species introductions. *Phil. Trans. R. Soc. B*. <https://doi.org/10.1098/rstb.2017.0445>.
- Smith, B.R.** et al. (2018). Mussels can both outweigh and interact with the effects of terrestrial to freshwater resource subsidies on littoral benthic communities. *Science of The Total Environment*. <https://doi.org/10.1016/j.scitotenv.2017.11.318>.
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Peer Reviews

Journal of Vertebrate Biology (7); African Journal of Ecology (3); Ecological Solutions & Evidence (2); Scientific Reports (2); Bioacoustics (1); Ecology and Evolution (1); Global Ecology and Conservation (1); The Journal of Wildlife Management (1).

Conference Attendance & Organisation

- 2023 **Wolves Across Borders** (Sweden) – Oral & poster presentation, & bioacoustics workshop (upcoming).
 - 2022 **Pathways Europe: Human Dimensions of Wildlife** (Netherlands) – Oral presentation.
 - 2022 **Mammal Society Spring Conference** (virtual) – Organised & oral presentation.
 - 2021 **SCB International Conference for Conservation Biology** (virtual) – Oral presentation & panel discussion.
 - 2021 **Mammal Society Spring Conference** (virtual) – Organised & poster presentation.
 - 2020 **BES Festival of Ecology** (virtual) – Oral presentation.
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Teaching Experience

- 2020-2022: Guest lecturer for Nottingham Trent University – MSc ‘Human-Wildlife Conflict’ module.
 - 2022: Nottingham Trent teaching staff on BSc ‘Wildlife Field Techniques & GIS’ field trip to Somiedo, Spain.
 - 2022: Postgraduate Teacher Training Course through Nottingham Trent University.
 - 2021: CERES International ‘Field Course Leadership Skills’ Training in Portugal.
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In the Media

- [Dogs used to guard livestock may have unintended costs to wildlife](#), *The Conversation* (author).
 - [How the massive dogs bred to protect livestock could save wolves too](#), *New Scientist* (interviewee).
 - [The Dog who Cried Wolf: Promoting Co-existence with Carnivores through Livestock Guarding Dogs](#), *Ecology for the Masses* (interviewee).
 - [Camera trapping in Romania](#), *Turnul Sfatului* (interviewee).
 - [Q&A with Beth Smith: The Ecological Impacts of Livestock-Guarding Dogs](#), *The Jaguar & Its Allies* (interviewee).
 - The Guardian’s Week in Wildlife: [October 2021](#), [February 2022](#), [April 2022](#).
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Referees available on request
