

# BETHANY R. SMITH

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## EDUCATION

01/20 - present **PhD**, Nottingham Trent University (NTU)  
09/17 – 09/18 **MRes Ecology, Evolution & Conservation**, Imperial College London – **Distinction**  
10/13 – 06/16 **BA Natural Sciences (Zoology)**, University of Cambridge – **First**

## PhD RESEARCH SUMMARY

### Title: The ecological effects of livestock guarding dogs and potential implications for conservation.

I am investigating the ecological effects of using dogs to protect livestock from wild predators, specifically how such dogs – livestock guarding dogs (LGDs) – interact with and affect co-occurring wildlife. I conduct my fieldwork in the Romanian Carpathian Mountains with Fauna & Flora International (FFI) where I monitor LGD behaviours and diets through GPS tracking, point-of-view video footage, and scat analysis. I am assessing the spatial and temporal responses by wildlife to LGD presence using camera traps and subsequent occupancy and activity pattern analyses. I am particularly interested in quantifying and characterising LGD-wildlife interactions, where ‘wildlife’ encompasses large carnivores, predominantly grey wolves (*Canis lupus*) and brown bears (*Ursus arctos*), as well as species that do not pose a predatory threat to livestock in the area such as red deer (*Cervus elaphus*) and wild boar (*Sus scrofa*). I am supervised by Drs Antonio Uzal (NTU), Richard Yarnell (NTU), Katherine Whitehouse-Tedd, and Iain Trewby (FFI).

## AWARDS & FUNDING

- **Best Student Poster** – 2021 Mammal Society 66<sup>th</sup> Spring Conference - [“How might Livestock Guarding Dogs \(LGDs\) affect Wildlife?”](#)
- **2019 Christine Stevens Wildlife Award** (\$15,000) - “Passive monitoring of wild wolves using acoustic detectors”

## PUBLICATIONS

- Smith, B.R., Root-Gutteridge, H., Butkiewicz, H., Dassow, A., Fontaine, A., Markham, A., Owens, J., Schindler, L., Wijers, M. and Kershnerbaum, A. (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., August, T.A., Harrower, C.A., Powney, G.D. and Mathews, F. (2021). Using biological records to infer long-term occupancy trends of mammals in the UK. *Biological Conservation*, 264(3), p.109362. <https://doi.org/10.1016/j.biocon.2021.109362>
- Smith, B.R., Yarnell, R.W., Uzal, A. and Whitehouse-Tedd, K. (2020). The ecological effects of livestock guarding dogs (LGDs) on target and non-target wildlife. *Journal of Vertebrate Biology*, 69(3), pp.1-17. <https://doi.org/10.25225/jvb.20103>
- Mathews, F., Smith, B.R., Harrower, C.A., Coomber, F.G. (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., Marshall, C., Coomber, F.G., Kubasiewicz, L.M., Anderson, M., Wright, P.G. and Mathews, F. (2020). Effects of Artificial Light at Night (ALAN) on European Hedgehog Activity at Supplementary Feeding Stations. *Animals*, 10(5), p.768. <https://doi.org/10.3390/ani10050768>
- Crawley, D., Coomber, F., Kubasiewicz, L., Harrower, C., Evans, P., Waggitt, J., Smith, B.R. and Mathews, 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*, 373(1761), p.20170445. <https://doi.org/10.1098/rstb.2017.0445>
- Smith, B.R., Aldridge, D.C. and Tanentzap, A.J. (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*, 622, pp.49-56. <https://doi.org/10.1016/j.scitotenv.2017.11.318>

## CONFERENCES, SEMINARS, WORKSHOPS

1. **2021 SCB International Conference for Conservation Biology** (virtual) – Oral presentation + panel discussion
  2. **2021 Mammal Society 66<sup>th</sup> Spring Conference** (virtual) – On conference committee & [poster presentation](#)
  3. **2020 BES Festival of Ecology** (virtual) – Oral presentation
  4. **2019 Mammal Society 65<sup>th</sup> Spring Conference** (Glasgow, UK) – Helped organise & attended
  5. **2018 IENE Bats & Infrastructure Conference** (Stockholm, Sweden) – Poster presentation
  6. **2018 Mammal Society Autumn Symposium** (London, UK) – Helped organise & attended
  7. **2018 Frontiers in Ecology Evolution & Conservation Symposium** (Ascot, UK) – Oral presentation
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1. **Bridging Brains and Bioacoustics Seminar** – presenter, scheduled for March 2022
  2. **Postgraduate Teacher Training Course** (Online), January 2022
  3. **CERES International ‘Field Course Leadership Skills’ Training** (Aljezur, Portugal), December 2021

## RESEARCH & WORK EXPERIENCE

- 12/19 - present    **Student Representative: Mammal Society**
- Created and maintain [Student Research Hub](#) on Mammal Society website.
  - Co-ordinating and copy-editing [Student Spotlight](#) blogs.
  - Co-ordinating the [University Mammal Challenge](#).
- 12/19 – present    **Passive acoustic monitoring of wild canids (Wisconsin, USA)**
- Deployed autonomous acoustic recorders in woodland in central Wisconsin to monitor wolf, coyote and dog movements and interactions via multilateration of vocalisations.
  - Processed resulting data in Raven Pro.
- 10/18 – 12/19    **Data & Information Officer: Mammal Society (Brighton, UK)**
- Coded large sections (RMarkdown and Shiny) of [Ecobat](#), the society’s web tool for automated bat activity analysis.
  - Co-ordinated several UK-wide 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 for mammals.
- 04/18 – 10/18    **Temporal responses of brown bears to human activity (Master’s - Distinction, 79%)**
- Managed >500,000 camera trap photos to investigate the temporal responses of brown bears to tourists in the Plitvice Lakes National Park, Croatia.
  - 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 (IoZ, ZSL).*
- 11/17 – 04/18    **eDNA for water voles and American Mink (Master’s – Distinction, 74%)**
- Designed primers and probes for qPCR using the NCBI database and Geneious.
  - Collected and extracted DNA from animal tissue and water samples then performed PCRs to check designed primers and qPCR to determine amplification of target species.
  - *Supervisor: Professor Vincent Savolainen (Imperial College London).*
- 06/17 – 09/17    **Research Intern: Ives Lab, University of Wisconsin-Madison (Mývatn, Iceland)**
- Responsible for sampling at the main site on the lake taking sediment cores and water samples. Helped sample the terrestrial food web with sticky cards and in-fall traps for adult midges and pitfall traps for arthropods.
  - Processed the samples in the laboratory: midge larvae, zooplankton and terrestrial arthropod identification, and chlorophyll extraction and analysis.

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- 11/16 – 12/16 **Research Intern: Lupus Laetus** (*Liekka, Finland*)
- Tracked large carnivores in the snow for up to 10-15km per day; plotted data in QGIS.
  - Collected and processed wolf and lynx scats.
- 09/16 – 11/16 **Research Intern: Sea Watch Foundation** (*New Quay, Wales*)
- Developed strong observational skills conducting surveys of marine mammals and photo-identification of bottlenose dolphins.
  - Delivered presentations during boat tours to raise awareness of cetacean behaviour, ecology and conservation.
- 07/15 – 02/17 **Freshwater Mussels as Ecosystem Engineers** (*Undergraduate Research Project – First, 70%*)
- Placed freshwater mussels into sediments of different organic matter percentages and recorded the changes in sediment chemistry (pH, dissolved organic carbon, nitrogen and phosphorus), benthic algae, zooplankton communities and mussel growth.
  - *Supervisors: Dr Andrew Tanentzap & Dr David Aldridge (University of Cambridge).*
- 10/15 – 12/16 **Chorus Howling in Wolves** (*Voluntary project - University of Cambridge*)
- Collected and analysed acoustic data from captive wolves to investigate the characteristics of howls from different subspecies of wolves. Used 'Raven' to analyse the recordings.
  - *Supervisors: Dr Arik Kershenbaum (University of Cambridge), Dr Holly Root-Gutteridge (University of Sussex) & Vicente Palacios (University of Valencia).*
- 06/16 – 08/16  
&  
07/15 – 09/15 **Field Assistant: Tanentzap Lab, University of Cambridge** (*Sudbury, Canada*)
- Joined a small team based at the Vale Living with Lakes Centre to set up and routinely sample mesocosms in three different lakes as part of a large-scale restoration project.
  - 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).

## POSITIONS OF RESPONSIBILITY

- 09/17 – 09/18 **Student Representative: MRes Ecology, Evolution & Conservation** (Imperial College London)  
Collected opinions of students on the course and presented constructive feedback in meetings throughout the year, whilst working with the course organiser to organise events e.g. careers workshops, analysis help sessions and presentation practice sessions.
- 09/17 – 09/18 **President & Founder: Silwood Park Mammal Society** (Imperial College London)  
Lead the winning team of The Mammal Society's 2018 University Mammal Challenge, during which I organised a campus-wide camera trapping survey, and several events (mammal ID workshop, small mammal trapping, and footprint tunnels).
- 10/15 – 06/16 **President and Founder: Cambridge University Ecology Education Society**  
Successfully managed a team of students to create and deliver ecology workshops in Cambridge primary schools. We were able to deliver the workshop five times and, on each occasion, received amazing feedback from both teachers and pupils.

## SKILLS

IT: MS Office Packages, R including RMarkdown and Shiny (data analysis and automated code), Raven (bioacoustics), Camelot and Wildlife Insights (camera trap data management), QGIS (spatial data).

Driving: Full, clean UK driving license; off-road driving; driving in snow; rides trials motorbikes.