- Shropshire Mammal Group -
2023

Research Guide for Students, Professionals and Citizen Scientists

2023

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Introduction

The UK is home to 90 mammalian species, with approximately 85 of which that are classified as terrestrial species. . One in four of these species are now at risk of severe declines, and ultimately extinction, due to a combination of habitat loss, human persecution, pollution, and climate change. Monitoring and studying these species can provide crucial information for conservation efforts and habitat management strategies. For example, research can help us gain a deeper understanding on why certain species are declining, and how we can adapt to conserve and enhance populations.

SMG is a group of mammologists who aim to advocate for and monitor mammalian populations in Shropshire. A large part of our work involves is in the education of our members and the public through educational talks, *in situ* surveys, and the production of our quarterly newsletter. For those who are familiar with or have heard of SMG, you may recognise us as being heavily involved in research pertaining to pine martens and harvest mice. In the past five years, we have also made efforts to map mammal populations as part of our Shropshire Mammal Atlas. SMG are passionate about studying mammals and encourage students, professionals, and citizen scientists to conduct research with our support. Although the following document predominantly refers to research projects for the production of a thesis at undergraduate and post-graduate levels, we encourage those who are not students to pursue research if they wish to do so.

SMG and Mammal Research

Shropshire Pine Marten Project

The Shropshire Pine Marten Project was created in 2009 by our chair, Stuart Edmunds. This project aims to monitor pine marten abundance and distribution throughout Shropshire by camera trapping and investigating reported sightings. Fifteen den boxes are now installed throughout the Shropshire Hills AONB; three of which are now occupied. Current research focuses on summarising the Project, estimating pine marten abundance, and studying species co-occupancy. Previous research has investigated habitat suitability and landscape suitability.

National Harvest Mouse Survey

The National Harvest Mouse Survey was established by the Mammal Society in 2021 to monitor harvest mice populations throughout the UK. This was developed to help fill in knowledge gaps and assist in conservation strategies for the species. Although studies have suggested the extent to which harvest mice populations have been declining, there is no true estimate of harvest mice abundance in the UK; hence the need to survey the species.

SMG conducts regular harvest mouse survey throughout the surveying period, October to March. Due to our surveying efforts, we are happy support students in collecting primary data and can provide secondary data from previous years.

Shropshire Mammal Atlas

The Shropshire Mammal Atlas is a collection of maps showing the distribution of our terrestrial mammals at tetrad [2km^2] resolution. Unfortunately, the maps were last updated in 2018. Therefore, SMG are interested in collaborating with people with GIS knowledge and/or experience to help update the maps.

Shropshire's Mammals

The following species can be found on the Shropshire Mammal Atlas. Some species are continuously present throughout Shropshire, whilst others are occasional and seemingly random sightings.

Continuously Present Species:

> American Mink (*Neovison vison*)
> Badger (*Meles meles*)
> Bank Vole (*Myodes glareolus*)
> Brown Hare (*Lepus europaeus*)
> Brown Rat (*Rattus norvegicus*)
> Common Shrew (*Sorex Araneus)*
> Fallow Deer (*Dama dama*)
> Field Vole (*Microtus agrestis*)
> Grey Squirrel (*Sciurus carolinensis*)
> Harvest Mouse (*Micromys minutus*)
> Hazel Dormouse (*Muscardinus avellanarius*)
> Hedgehog (*Erinaceus europaeus*)
> House Mouse (*Mus musculus*)
> Mole (*Talpa europaea*)
> Otter (*Lutra lutra*)
> Pine Marten (*Martes martes*)
> Polecat (*Mustela putorius*)
> Pygmy Shrew (*Sorex minutus*)
> Rabbit (*Oryctolagus cuniculus*)
> Red Fox (*Vulpes vulpes*)
> Reeve's Muntjac (*Muntiacus reevesi*)
> Roe Deer (*Capreolus capreolus*)
> Stoat (*Mustela erminea*)
> Water Shrew (*Neomys anomalus*)
> Water Vole (*Arvicola amphibius*)
> Weasel (*Mustela nivalis*)
> Wood Mouse (*Apodemus sylvaticus)*
> Yellow-necked Mouse (*Apodemus flavicollis*)

Occasional Sightings:

> Chinese Water Deer (*Hydropotes inermis*)
> Red Deer (*Cervus elaphus*)
> Sika Deer (*Cervus nippon*)
> Wild Boar (*Sus scrofa*)

Topics and Techniques

This following list is a collection of topics and techniques used in dissertations from Nottingham Trent University. We hope this helps students and researchers think about what projects they might study.

Topics

> Abundance

> Distribution

> Dietary preference and/or availability

> Habitat use

> Habitat preference

> Species behaviour

> Estimating population size

> Range

> Species co-occupancy

> Diurnal occurrence

> Road ecology and species casualties

> Impact of light pollution

> Predator-prey interactions

> Latrine use

> Effects of environmental parameters

> Liaison with other groups/ organisations

Methods

> Camera trapping

> Hair samples

> Observations

> Scat/spraint analysis

> Comparisons

> Mark-capture-recapture

> GIS mapping

> ID of prey remains in pellets

> Questionnaires

> Habitat modelling

SMG Resources

Datasets

We have a large data set of on-going mammal sightings in Shropshire collected over several years. These observations have been collected by amateurs and submitted to our web site, more recently to iRecord, and collated by our SMG records officer. We would be very interested in students to study this data for their degree research e.g., BSc honours or post-graduate projects and/or dissertations. This data could form the basis of a citizen science project and could be used on its own, or in conjunction with additional data collected by the student which could focus on a specific aspect of the data. The additional data collection might seek to explain the reasons for specific distributions or changes.

Equipment

- Small Mammal Traps
- Camera Traps (already Installed)

Contacts

- Cuan Wildlife Trust
- NatureSpy
- Pricklebums Hedgehog Rescue
- Shropshire Badger Group
- Shropshire Bat Group
- Shropshire Dormouse Group
- Shropshire Wildlife Trust
- Whitchurch Water Voles
- Wolf Watch

Our Experience

Stuart Edmunds (Chair) - Pine marten surveys and ecology; otter surveys; camera trapping; small mammal trapping; dormouse surveys; harvest mouse survey coordination.

Jöerg Niehoegen (County Mammal Recorder) - holder of mammal records; small mammal trapping; species ID.

Ric Morris (Newsletter Editor) - Osteology of British mammals; skulls; bones identification; bone ID training (Mammal Society trainer); owl and raptor pellet dissection; vertebrate prey bones ID.

Julia Casperd (Committee Member) - survey methodology; habitat management; peatland ecology; small mammal trapping; surveying of larger mammals.

Lynn Besenyei (Committee Member) - Section 41 species and their conservation, habitat use; intra- and inter-species behaviour; grassland habitat creation; grassland and woodland management; survey and sampling techniques; small mammal trapping; camera trapping.

Kathryn Jones (Committee Member) - Hedgehogs; environmental education.

Lucy Morriss (Committee Member) - Camera trap surveys; pine marten ecology, species reintroductions; species interactions; vegetation surveys, impact of abiotic factors of species abundance and distribution, *in situ* studies; quantitative research; European research.

Example Research Titles

This is a list of titles of theses that have been written on mammals and is included here to give ideas on the types of mammal projects that are feasible from collecting field data on mammals.

> An assessment of small mammal populations in habitat type.

> An investigation into the habitat preferences of species name in an urban park.

> An investigation into the habitat preferences of species name in three natures reserves in name of county.

> The effects of species name grazing on plant diversity in habitat type.

> An investigation into road ecology and fatality rate of species name along roads in name of county.

> Species name behaviour and habitat use in name of county.

> The impact of human disturbance on species name populations.

> An investigation in carnivore/meso-carnivore name abundance on prey distribution in name of county/habitat type.

> Assessing habitat suitability for the reintroduction of species name (e.g. beavers, pine martens etc.) in name of county.

> Dietary preferences of species name in habitat type.

> An investigation into species name habitat preferences in urban and rural environments.

> The abundance and distribution of species name in wetlands and riparian zones in name of county.

> Mammal diversity in agricultural areas in name of county.

> Species name abundance and distribution on rural farms.

> Seasonal changes in species name abundance throughout habitat type/name of county.

> Investigating the environmental variables on species name populations in name of nature reserve.

> An investigation into the reasons for admission of species name to name of wildlife rescue centre.

FAQs

How do I get involved with SMG?

Feel free to contact us using one of the 'Contact Us' boxes on our website—shropshiremammalgroup.com, or contact a committee member directly.

Do we have any species of interest?

Species of particular interest are hedgehogs, otters, hares, mink, water vole and pine martens but we have data on other species.

Do we have any focus areas?

We are interested to see if species are increasing or declining. Also, whether the distribution of species is changing across the county e.g., increasing occurrences in rural, or urban, areas and this may depend on the extent of human interference or change in agricultural practice(s). Similarly, are some species more associated with gardens? Where have species declined across the UK are these declines also seen in Shropshire? Have other species declined/ increased as a consequence of population crashes?

Can conducting a research project with SMG help students and professionals gain useful skills?

SMG are keen to know if species populations are denser than others across the county and whether this has changed over the years for which we have data. These data sets lend themselves to analysis using Geographic Information Systems (GIS) which would provide additional employability skills. Participating in research focusing on small mammal can also help students, citizen scientists, and professional

Extra! Creating a Thesis: Advice from SMG

A dissertation (also known as thesis) is most likely one of the biggest projects a student has undertook. Although the idea of developing and writing a dissertation can be rather daunting, small decisions can make a big impact on the easing some of the process. Here we offer some advice for students who need that extra help and support.

Step 1: Finding Your Niche

One of the main struggles of writing a dissertation is maintaining motivation as it is a long and occasionally tedious time. Identifying and choosing a topic you're passionate about can therefore be very helpful in increasing motivation levels and easing the process. It might, in fact, make you slightly excited about writing a dissertation as it's something you structured around a topic you find interesting. Therefore, there are three things to consider when brainstorming your dissertation:

What are you passionate about?

Take the time to create a list of your passions that are linked to your degree. In the ecology world, these could be a list of native or invasive species, habitats, environmental issues (such as climate change, pollution etc.).

Would you like your dissertation to relate to your dream job?

Dissertations can be useful in taking a step up on your career ladder. This could be because you use your dissertation to gain experience on a surveying method, help increase your knowledge on a particular topic,

or get yourself extra experience with a specific statistical software. For example, future silviculturists might want to focus of woodland habitats for their thesis, or an aspiring ecologist might study bats, dormice, or badger setts.

Would you like to use your dissertation to form professional connections?

Some environmental organisations have dissertation ideas for students and researchers. These can be with national organisations such as Natural England, and smaller local organisations like local mammal groups.

Some extra notes:

- After finding a topic your passionate about, do a bit of digging on any research gaps related to your foci. **Hint:** there might be suggestions for future research in the conclusions of journal articles.
- Try not to just be given a title by your supervisor but to choose your own topic and then to craft it into a project with the help of your supervisor.
- Try to think if the project is both achievable and affordable.

Step 2: Planning Your Methodology

Things to consider:

- Is your research quantitative, qualitative, or mixed? Are you planning to conduct and *in situ* study or desk- based study?
- Apart from travel what are the likely costs? E.g., cost of bait, batteries, SD cards
- What is the likely time commitment? How many hours are you required to put into the fieldwork?
- Choose a site that is accessible that doesn't require too much travelling, e.g. local nature reserve, country park, SSSI or NNR.
- Is the species you wish to study active during the period of study, e.g., does it hibernate?
- What kind of equipment do you wish to learn to use? E.g., Longworth trap, Sherman trap, camera trap.
- What kind of analysis do you wish to use for the type of data set that you wish to collect? Most data sets will require statistical analysis.

Step 3: Dissertation Chapters

Abstract - The last section you write. It is a short, concise summary of every section in your dissertation.

Introduction - Background information explaining why your topic is important.

Lit Review – A critical review of previous research related to your topic. Identify the advantages and disadvantages, research gaps, and recommend ways to mitigate any issues identified.

Methodology – Explanation of the reasons why you have chosen a specific method and analysis, supported by other research.

Methods - A past-tense description of how you collected data and which statistical analyses you used.

Results – Present your findings via tables and graphs. Verbally describe your results. **DO NOT** interpret unless necessary.

Discussion – Briefly describe your findings and interpret. Detail how other research supports or opposes your findings, and explain the implications and applications of your research.

Conclusions – Summary of your research. Try to include the limitations of the study, recommend ways of amending them, and describe opportunities for future research.

References – An alphabetical list of references you've used throughout your dissertation. Remember to use the referencing style your university uses.