

April 2026

Newcastle-under-Lyme Borough Council

# Studying pollinators & bats at sites of bereavement in Newcastle-under-Lyme Borough

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## Introduction & Background

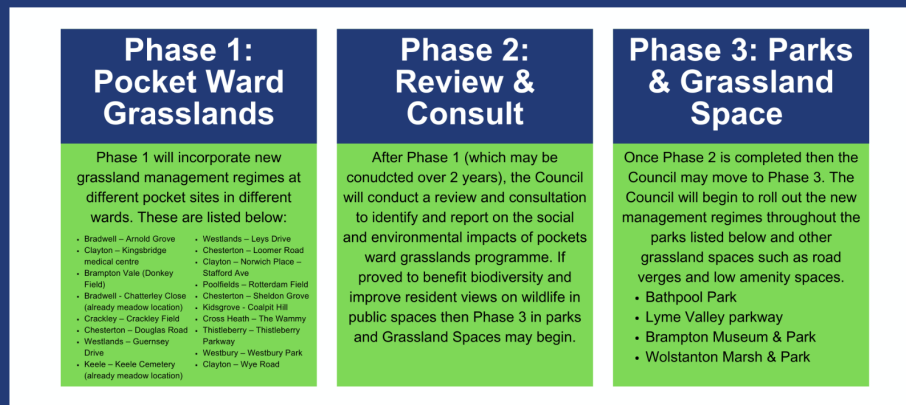
Newcastle-under-Lyme Borough Council aims to create a sustainable Council and Borough for the protection of future generations and the local natural environment through its Sustainable Environment Strategy and Delivery Plan - [A net-zero Newcastle – Newcastle-under-Lyme Borough Council](#). From becoming Net Zero by 2030 to engaging residents with sustainability the Council is acting upon over 120 actions that are reviewed every 6 months. A very important part of the strategy is recovering the local natural environment, one such way through more sustainable grassland management.

Newcastle-under-Lyme Borough Council Sustainable Environment and Streetscene Services attended a sustainable land management training session with Staffordshire Wildlife Trust in January 2024. From this session the Council began development of a Grassland Management Strategy to promote the growth of long grasses in the borough.

The Council has an expansive amount of strictly mowed grasslands in the borough which have the potential to serve the residents an environment of Newcastle a lot more through the promotion of long meadow growth.

This strategy is organised through two key documents, the main strategy document and the policy documents which includes 6 bespoke policies on how to mow various different spaces such as informal sports pitches, pathways, meadow edges and verges, areas of high social value, low activity and tree area and finally wildflower meadows. The strategy outlines background information, main aims, plan and a timeline. the policy document outlines all 6 different grassland identifications and how they should be mowed. The Strategy and policy documents can be found in full here - [Natural environment – Newcastle-under-Lyme Borough Council](#).

# Grassland Management Strategy



**Figure 1. Grassland Management Strategy Phases**

When reviewing the impacts of the first 60 hectares of long meadows over 18 sites in the Borough, the Council found positive impacts on sequestration, local resident/visitor engagement and on resource capacity for the Council. Since the adoption of Phase 2 by the Council in January 2025, phase 3 has been continued with a couple hundred of hectares of long meadows being facilitated throughout the Borough (Since April 2025). Many of these sites are parks or small green spaces however the Council also identified sites of bereavement as a significant opportunity for long grass as well.

Since the Council had yet to be able to identify any data regarding to the biodiversity of the meadow sites The Council decided to partner with Keele University to bring in student and professor expertise to determine the impacts of sites of bereavement on local wildlife when managed more sustainably.

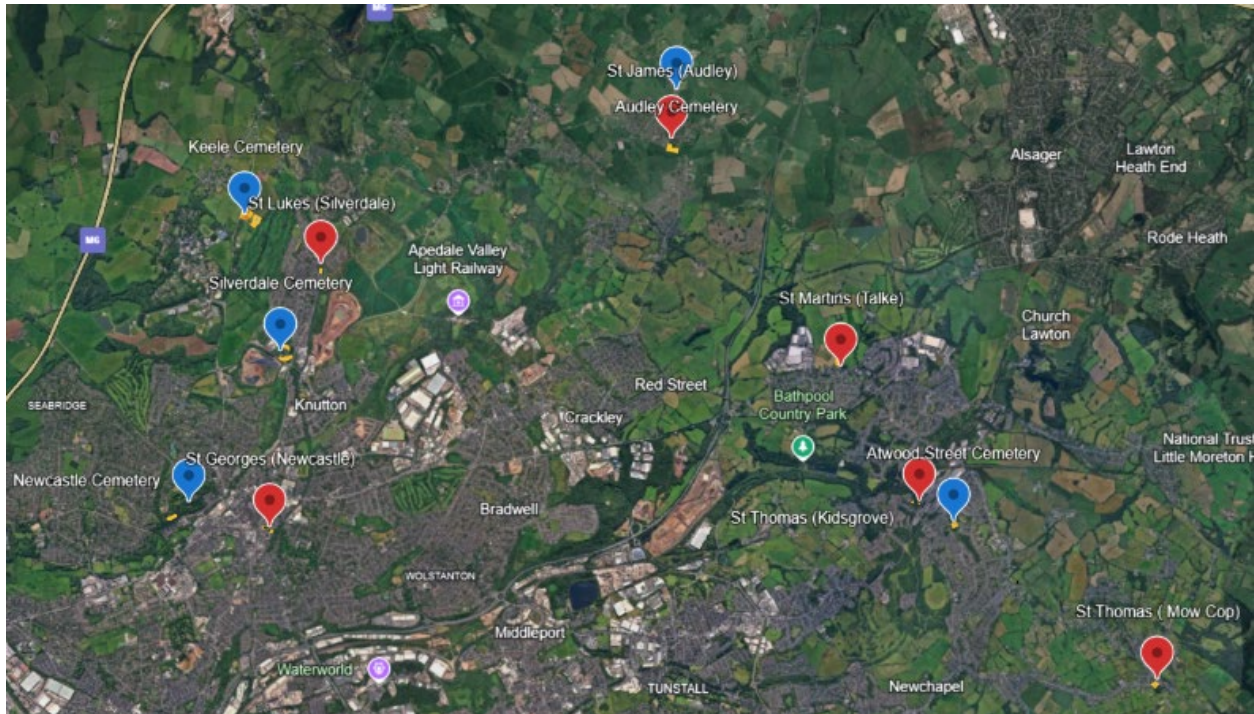


**Figure 2.** *Long meadow with cut paths and edges at Keele Cemetery*

Newcastle-under-Lyme Borough Council and Keele University came together to study the natural impacts of long grassland on 11 sites of bereavement including cemeteries and churchyards. 2 students from Keele University showed interest in the project, one studying pollinators and the other bats and habitat connectivity. The Council also ran a social survey at the same time to study and understand the perceptions of grasslands on bereavement sites from visitors. These sites were all visited by the entire collaborative team on the 11<sup>th</sup> of April 2025 before the growing season, sites include:

- Saint George's Church & Centre, Cherry Orchard, Newcastle-under-Lyme, Newcastle ST5 2UB
- Newcastle under Lyme Cemetery, Lymewood Grv, Newcastle-under-Lyme, Newcastle ST5 2EH
- Silverdale Cemetery, Newcastle-under-Lyme, Silverdale, Newcastle ST5 6PA
- St Lukes, 177 Church St, Silverdale, Newcastle ST5 6JJ
- Keele Cemetery, Keele Rd, Newcastle ST5 5AB
- St James the Great Church, Audley, Church St, Audley, Stoke-on-Trent ST7 8DE
- Audley Cemetery, Audley, Stoke-on-Trent ST7 8DL
- St Martin's Church, Talke, 12 Crown Bank, Talke, Stoke-on-Trent ST7 1PU
- St Thomas Church, The Avenue, Kidsgrove, Stoke-on-Trent ST7 1AG
- Atwood Street Cemetery, 101 Attwood St, Kidsgrove, Stoke-on-Trent ST7 4AN

- St Thomas Church, Mow Cop, 5 Congleton Rd, Mow Cop, Stoke-on-Trent ST7 3PJ



**Figure 4.** Google Earth map of all 11 sites of bereavement in this study

This study mainly aims to study and discover the impacts on pollinator/bat biodiversity and habitat connectivity at churchyard and cemetery sites in Newcastle-under-Lyme Borough from more sustainable land management methods such as reduced mowing. The objectives are as follows:

1. To discover the impact of sustainable land management methods on pollinator biodiversity at Newcastle Borough churchyard and cemetery sites.
2. To discover the impact of sustainable land management methods on habitat connectivity at Newcastle Borough churchyard and cemetery sites.
3. To study and review the local perceptions and reactions on more sustainable land management methods of site visitors.
4. To supply valuable and interesting opportunities to local students who can use them for study, work placements and experience in the field
5. To use dissertation recommendations and findings to increase local pollinator biodiversity, habitat connectivity and engagement among site visitors.

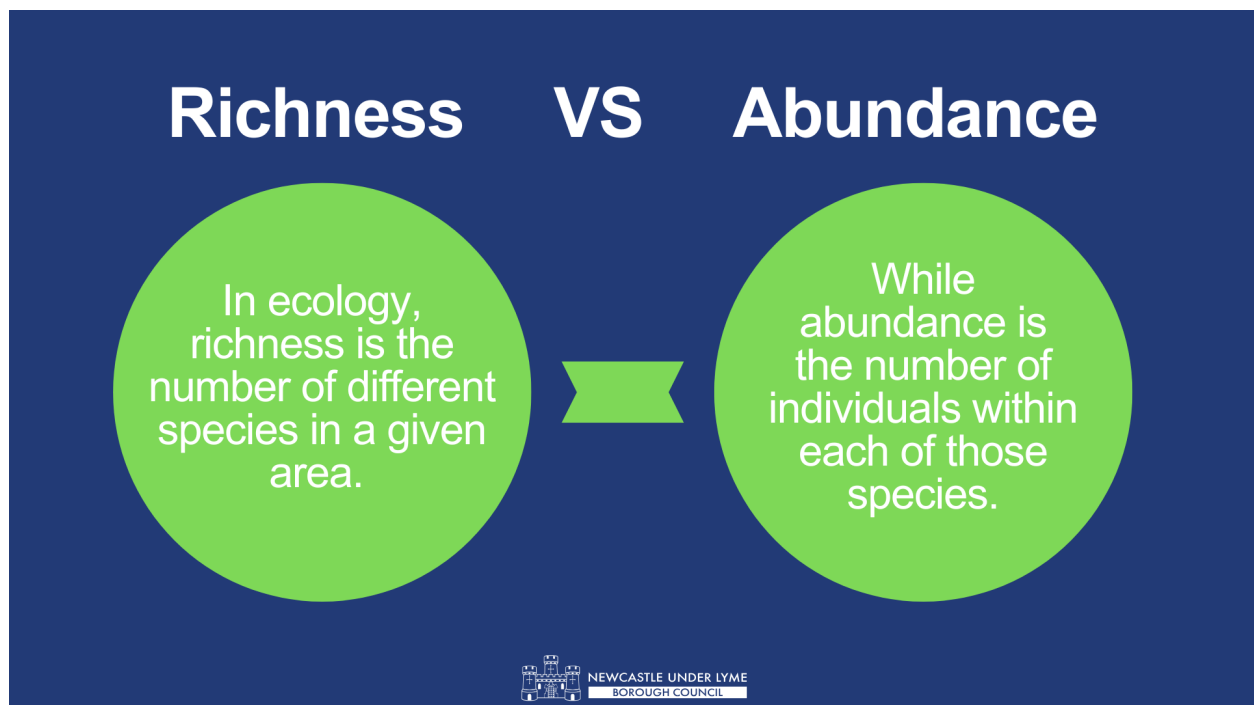
The project began to take shape in the beginning of 2025, April saw the first site visits with the entire collaborative team, then the Council installed site barriers and signage in early May, The Keele University team began data collection from may till June during

the growing season, and finally the analysis included in this report was conducted from June till early 2026.

### Studying Pollinators

This project explores how different mowing management strategies impact pollinator assemblages and populations in churchyards and cemeteries throughout Newcastle-under-Lyme borough. These often-overlooked green spaces serve as valuable refuges for biodiversity, particularly in urban and suburban areas where natural habitats are fragmented.

The study aims to understand how the vegetation structure that develops with/without mowing influences the abundance and diversity of pollinators such as bees, butterflies, and hoverflies. The findings will offer insights into how small-scale changes in land management can enhance ecological value and contribute to local conservation efforts.



**Figure 5.** Chart showing the difference in between species richness and abundance

Pollinator assemblages and populations in long grasslands at the 11 sites were studied through sticky traps and observations made by the student researcher. Below are the sticky trap findings:

#### Richness Findings:

- Models suggested unmown areas had negative effect on overall richness, but raw data (boxplots) and key covariates (days since mowing) showed the opposite trend.

- Lepidoptera richness increased significantly in unmown plots, while hoverflies decreased.

#### Abundance Findings:

- Unmown plots had significantly higher overall pollinator abundance.
- Wasps benefitted most, while hoverflies and beetles were negatively impacted in unmown plots.
- Environmental drivers (days since mowing, floral richness, urban gradient, and trap colour) shaped outcomes for abundance.



**Figure 6.** Photos of sticky traps used to collect invertebrate data

Pollinator assemblages and populations in long grasslands at the 11 sites were studied through sticky traps and observations made by the student researcher. Below are the observational findings:

#### Richness Findings:

- Unmown areas generally supported higher pollinator richness than mown areas (though not always statistically significant).
- Positive effects especially for bees, hoverflies, and lepidoptera.
- Days since mowing and floral richness have had a strong positive effect.
- Urban areas tended to have slightly higher richness than rural ones (this needs further study).

#### Abundance Findings:

- Unmown areas had greater pollinator abundance, with significant effects for hoverflies and lepidoptera.
- Days since mowing had a significant effect on abundance.
- Beetle abundance increased with shade and time since mowing.



**Figure 7.** *Photos of invertebrates found in long meadows at sites of bereavement*

Overall, reduced mowing on the 11 sites of bereavement studied enhanced pollinator communities by increasing abundance and, in most cases, richness. It is important to note that pollinator responses vary by taxonomic group with Bees, Hoverflies, and Lepidoptera generally benefit, and Beetles and Wasps showing mixed/contrasting responses. For management practices, the data helps show that longer intervals between mowing and higher floral richness improve pollinator diversity and abundance.

### Studying Bats & Habitat Connectivity

This research investigates the influence of habitat fragmentation on biodiversity by exploring the relationship between vegetation density and connectivity, and bat (Chiroptera) activity within selected urban green infrastructure patches at churchyard sites in the Staffordshire County, United Kingdom (UK). Newcastle-under-Lyme Borough Council and Keele University is collaborating on this project. We aim to utilise

the measure of bat activity as a bio-indicator within these historically and ecologically significant sites. The vocalisations of bats will be recorded using acoustic detectors to measure activity levels and GIS-based mapping of habitat, using remote sensing and environmental ground truthing combined with statistical modelling will enable habitats to be categorised.

The influence of habitat availability on bat species richness and activity within fragmented green spaces will allow us to propose strategies for wildlife habitat resilience, improve biodiversity connectivity, and mitigate the impacts of habitat fragmentation in urban areas. Bat species were studied through the collection of audio files from June to July with two recording devices at each site. 9,934 total audiofiles were collected, using Kaleidoscope software the student researcher will be able to identify different bat species present. To study Habitat Connectivity the researcher used a least-cost path analysis which identifies most likely routes of connectivity and generates maps. By studying these routes, we can identify what routes may currently be present and where there are barriers. The data is still being analysed and will be released in a separate report.

### Social Perceptions of Long Meadows

Alongside the Keele University Research Study, NuLBC conducted an online survey to understand visitor perceptions of long grass on sites of bereavement. The online survey was available during the study (2025 Growing Season) on the Council website and through signage at each site of bereavement.



**Figure .** Photo showing the “Why the long grass?” signs at sites of bereavement

It was found that visitors to sites of bereavement in Newcastle-under-Lyme:

- Valued natural beauty, bird songs and maintained graves the most.
- Mostly found long grass as a positive for these sites.
- Cared greatly for the local wildlife of these sites.

2. What is the most important thing to have at a cemetery/churchyard?



3. Do you think long grass and wildlife is a positive or negative thing in churchyards and cemeteries?



**Figure . Data from social survey on long meadows at sites of bereavement**

Additionally, when on site collecting data, the Keele University Team verbally feedback that visitors to the sites who couldn't take this survey due to accessibility to online devices enjoyed the site of long meadows mentioning the beauty of the sites and increased wildlife. So not only did the survey find mostly positive engagements on these meadows in bereavement sites but in person engagements also found positive perceptions of the change in maintenance for the local environment. Finally, a massive thank you to local community groups, parish councils and local churchyards for engaging with this project and supporting the work being undertaken.

In Conclusion

This study in collaboration between Newcastle-under-Lyme Borough Council and Keele University found reduced mowing on the 11 sites of bereavement studied, enhanced pollinator communities by increasing abundance and, in most cases, richness. Overall long meadows and reducing the intensity of mowing at sites of bereavement were a great way to recover and encourage local invertebrates.



**Figure .** *Photo of long meadow with wildflowers at Keele Cemetery*

This project would not have been possible without the Keele University and Councils Teams involved! Thank you to the Keele University Team composed of Helen Taylor-Boyd (Lecturer), Masoud Sadatmadani (Student Researcher), Freya Barber (Student Researcher), Dr Christian Devenish (Lecturer in Ecology & Environment) and Dave Hulse (Lecturer in Bioscience) for their expertise, data collection and research, analysis and reporting for the successful delivery of this project. Thank you to the Bereavement and Streetscene Teams at the Council composed of Kay Booth (Cemeteries Registrar), Chris Hollingworth (Cemeteries Supervisor), Robert carter (Neighbourhood Manager), Thomas Guilbert-Newell (Sustainable Environment Officer) and the grounds maintenance operational staff who managed the new grounds maintenance schedules and allowed for this project to happen!

Learn more about the project here - [Natural environment – Newcastle-under-Lyme Borough Council](#)