ONE Planet
Doctoral Training Partnership

Natural Environment Research Council

Project title: Grow or mow? Managing urban grasslands for pollinator conservation and soil ecosystem services

Ref: OP2460

Keywords: Urban ecology, pollinator conservation, soil ecology, biodiversity

One Planet Research Theme:
Climate & Climate Change ☐ | Earth System Processes ☒ | Anthropocene ☒ | Environmental Informatics ☐

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Key Research Gaps and Questions:

1) What are the impacts of different urban grassland management approaches on floral and pollinator communities?

2) What are the potential benefits and disservices of managing urban grasslands for pollinators on soil quality?

3) Do soil quality and properties interact with floral reward availability under different urban grassland management approaches?

4) How do people respond to urban grassland management approaches and value the ecosystem services they provide?

Urban grassland management © M. Goddard

Project Description: Urban expansion is a key threat to global biodiversity, with 70% of the global human population predicted to be living in urban areas by 2050. Urban grasslands comprise significant areas of cities, with the majority in public and private greenspaces typically managed by regular mowing to create 'neat' lawns. There is growing interest in improving urban grassland management to benefit biodiversity, with reduced mowing (e.g., the 'No Mow May' campaign) and addition of flowering 'meadows' or turf increasingly popular methods for mitigating insect pollinator decline in cities by increasing floral resource availability.

Whilst previous studies have explored the impacts of grassland management on pollinator communities or on soil quality and carbon sequestration, a key knowledge gap exists on how below-ground processes (soil function and ecology) interact with above-ground (floral resources, plant-pollinator interactions) communities in urban grasslands. Can pollinator-friendly urban grassland management provide lasting benefits to soil ecosystem services such as carbon sequestration, nutrient cycling and managing greenhouse gas emissions? Do soil properties affect nectar and pollen availability and quality and how does this affect pollinator communities?

This project will examine the relationship between above-ground and below-ground ecological processes and assess whether different management approaches influence this relationship and thus the quality of floral resources available for pollinators in urban grasslands. Fieldwork will take place in public parks, road verges and residential gardens across Tyneside, examining existing management approaches and incorporating field-based experiments. This will be complemented by laboratory analyses of soil properties. Public perception of different management approaches and ecosystem service provision in urban grasslands will be explored using social science methods.

Research will be designed in partnership with Urban Green Newcastle (CASE partner) and integrated with the Beelines North East project, utilising baseline data collected from urban parks in Newcastle upon Tyne. Findings will be incorporated into urban grassland management guidance via links with key policy and practice stakeholders. Training will be provided in pollinator sampling, plant identification, soil ecology and function measurements, data analysis and stakeholder engagement.

Prerequisites: This project is suitable for a student with a background in ecology. Fieldwork will involve sampling plants, insects and soils in an urban setting. Previous experience of pollinator research and plant identification is desirable. For more information, please contact Dr Katherine Baldock (K.Baldock@northumbria.ac.uk).

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