

CENTA Project Proposal Form – 2024 entry

Project Title	Planning-policy development to support biodiversity within urban green spaces
University (where student will register)	The Open University
Which institution will the student be based at?	As above
Theme (Max. 2 selections)	Climate & Environmental Sustainability <input checked="" type="checkbox"/> Organisms & Ecosystems <input checked="" type="checkbox"/> Dynamic Earth <input type="checkbox"/>
Key words	Urban ecology, urban planning, ecosystem services, nature-based solutions, soil science, nutrient management, water-regime
Supervisory team (including institution & email address)	PI: David Gowing (OU, d.j.gowing@open.ac.uk) Co-Is: Phil Wheeler (OU, philip.wheeler@open.ac.uk) Matthew Cook (OU matthew.cook@open.ac.uk)
Is the PhD suitable for part time study?	Yes <input checked="" type="checkbox"/> This is a requirement of NERC

Project Highlights:

- Habitat enhancement for biodiversity
- Developing multi-functional urban green spaces to provide nature-based solutions
- Translating science into planning policy and practice to help create more sustainable urban environments.

Overview:

As human society becomes increasingly urbanised, green space in urban centres has grown in importance. It can provide a range of benefits, such as flood-risk mitigation and nutrient management whilst contributing to the health and well-being of residents. Urban greenspace can also provide habitats that support biodiversity and bring people closer to nature.

However, little is known about creating and maintaining species-rich habitats within urban settings, which are often laden with plant nutrients. This project would aim to use current ecological theory on the drivers of diversity in plant communities to understand how species-rich grasslands can be established and maintained in an urban environment. Focusing on a range of urban grassland systems, niche-partitioning theory would be used to look at the drivers of current plant diversity. We would then work with local partners to carry out experimental changes to explore whether diversity could be increased.

Milton Keynes is a rapidly expanding city with a commitment to sustainability and improving urban biodiversity. It would be used as a model city to give the work a geographic focus and we would seek to work with partners to investigate the local policy-making process and how it might support greater urban biodiversity. By strengthening the link between planning policy and practice for green space and leading-edge biodiversity science, the proposal holds significant potential to increase the effectiveness of planning policy to create more sustainable urban environments.



Figure 1: A sustainable urban drainage (SUD) scheme as part of a new housing development in Cambridge
[Alt text: Photo of grassy swale, showing development of wet grassland vegetation in its base, sandwiched between a road and a row of houses.]*

Methodology:

The precise scope of the work would be developed with local partners (MK parks Trust, MK City Council, MK Natural History Society) but it would focus on public open space, such as the various SUD schemes around the city. Sampled plots would be analysed in terms of their soil-water regime and their nutrient availability. A smaller subset of plots would be manipulated in terms of these environmental variables to monitor the response of the plant community.

The results of the survey work would be used to develop strategies for increasing the biodiversity and ecosystem services provided by these areas. The student would work alongside planners and associated policy makers in local authorities to identify how and where policy development is required. The student would also work with planning organisations such as the Town and Country Planning Association to promulgate the findings of the work at the national scale.

Training and skills:

Students will be awarded CENTA2 Training Credits (CTCs) for participation in CENTA2-provided and 'free choice' external training. One CTC equates to 1/2 day session and students must accrue 100 CTCs across the three years of their PhD.

The successful student would be trained in the following skills:

- Sampling techniques in the field

- Plant identification
- Soil structural analysis
- Measurement of soil-nutrient status
- GIS mapping
- Statistical analysis techniques (including programming in R)
- Qualitative data collection (e.g. interviews and participant observation) and analysis, e.g. thematic analysis
- Ecosystem-services and associated planning policy and practice

Partners and collaboration (including CASE):

This project will involve collaboration with the Parks Trust and the City Council in Milton Keynes.

Possible timeline:

Year 1: Literature review. Skills development (particularly plant identification and field sampling techniques, statistical analysis and coding). Selection of sites for experimental manipulation. Baseline surveys of these.

Year 2: Maintenance of experimental sites. Observational surveys across a wider range of urban green space. Liaison and data collection with groups engaged in policy development.

Year 3: Data analysis. Planning a thesis structure and start of drafting.

Further reading:

Silvertown, J., Araya, Y. N. & **Gowing, D. J.** (2015) Hydrological niches in terrestrial plant communities: a review. *Journal of Ecology*, **103**, 93–108

Bowskill, V., Bhagwat, S., **Gowing, D.** (2023) Depleting soil nutrients through haymaking on floodplain meadows for habitat restoration and nutrient neutrality. *Biological Conservation*

Wildman, S. (2009) 'Nursing and the issue of 'party' in the Church of England: the case of the Lichfield Diocesan Nursing Association', *Nursing Inquiry*, 16, pp. 94–102. doi: 10.1111/j.1440-1800.2009.00441.x.

Abenyenga, O., Burgess, P., **Cook, M.**, Morris, J. (2009) Application of an ecosystem function framework to perceptions of community woodlands, *Land Use Policy* 26(3) 551-557.

*Creative Commons: <https://www.weadapt.org/sites/weadapt.org/files/legacy-new/placemarks/images/original/4eb532aa904c4suds-housing.jpeg>

Further details:

For further details please contact david.gowing@open.ac.uk