

Further Particulars

Ref: A1816

Senior Research Associate (PDRA) in Grassland Ecology

The post will deploy recent advances in soils research in temperate agricultural grasslands to help meet the challenge of building soil functioning and resilience in degraded grassland soils of the Tibetan-Qinghai plateau. Specific activities will include surveys, sampling and experiments to determine the impact of grassland degradation on multiple soil functions and their resilience to extreme climate events. The role also will contribute to testing the effectiveness of manipulating plant diversity and functional traits to build soil functioning and resilience and maximize plant production in degraded grassland soils.

The post will join a multi-disciplinary research team developing tools for restoring soil functioning and resilience to degraded grasslands in the Qinghai-Tibetan Plateau. This consortium includes co-investigators from the University of Manchester and partners at the North West Institute of Plateau Biology and CABI. This post is for 24 months full-time starting in the summer of 2017.

Background

Soil degradation presents a major threat to food security and human wellbeing. As highlighted in a recent UN report, some 33% of the world's soils are moderately to highly degraded and as much as 40 billion tons of topsoil are lost annually as a result of soil erosion. Further, these problems are especially acute in developing countries, where soil erosion can cause dramatic declines in food production and result in poverty and hunger. Much focus on soil degradation is centered on arable lands, but it is also a major problem across the world's grasslands, which cover ~ 37% of the earth's land surface and are of major importance for food supply and livelihoods. One such hotspot of severe soil degradation is the Qinghai-Tibetan plateau. This region is the largest area of grassland on the Eurasian continent, covering 25% of the land area in China. It is also the highest and largest plateau on Earth with an area of 2.5 million km² and an average altitude of 4500 m. Some 8 million people live on the plateau, of which 48% live in poverty, largely due to widespread degradation of the grasslands on which rural people depend. Grasslands cover 65% of the Qinghai-Tibetan plateau and play a major role in providing food and ecosystem services for rural people, largely through traditional yak, sheep and goat grazing, but also as a source of wild plants and fungi used in traditional Chinese medicine. However, livestock stocking rates on these grasslands have more than doubled in recent years, and overgrazing has contributed to massive grassland degradation and soil erosion, leading to increased rural poverty. These problems are also exacerbated by climate change, especially extreme events such as droughts, which are becoming more frequent, making soils more vulnerable to erosion. At present, estimates suggest that some 30-50% of grasslands on the Qinghai-Tibetan plateau are degraded, and in many cases soils have completely lost their ability to support grassland production, with extreme consequences for local people; many traditional herders live in poverty in this region, which is the third poorest in China. Despite this, land managers and policy makers remain puzzled about how to restore degraded grasslands to their once healthy state, and how to make them better able to buffer the vagaries of climate change. Grassland degradation is caused by many factors, so restoring them is not

straightforward. But key is the re-building of a fully functioning soil, on which plants that support livestock depend. We also argue that this recovery of soil health requires a holistic approach, involving the rebuilding of chemical, physical and biological properties of soil on which its functioning and resilience to climate change depends. Our goal is to restore fertility to degraded grassland soils of the Qinghai-Tibetan plateau and enhance their ability to buffer future climate change. We build on our research in UK grasslands where we have shown soil health and resilience can be promoted through manipulating the diversity and make up of grassland plant communities. We want to test this approach for restoring the functioning and resilience of degraded grassland soils of the Qinghai-Tibetan plateau, thereby helping to increase food production and improve human welfare in this region. To achieve this, we not only plan to carry out novel research, testing our ideas developed in UK grasslands on the degraded soils of the Qinghai-Tibetan plateau; but also we will build a multi-disciplinary team, including grassland scientists and stakeholders, with the capacity to develop robust solutions, based on sound ecological and socio-economic principles, for the restoration of soil functioning and resilience to degraded grassland in this and other low to middle income countries.

Lancaster Environment Centre

Lancaster Environment Centre forms one of the largest and most prestigious groups of interdisciplinary environmental researchers in Europe, with over 200 staff and research and teaching that span the Environmental, Biological and Social Sciences. LEC was formed through the merger of three successful university departments (Environmental Science, Geography and the non-Medical parts of Biology) and operates as a fully integrated university department on a single site. It is the largest department in Lancaster University and a key player in the strategic development of the institution and the Faculty of Science and Technology. The co-location of the NERC Centre for Ecology and Hydrology on the Lancaster campus as part of the LEC complex adds critical mass in environmental research capacity enabling staff from both organizations to work closely together in a formal collaboration. A distinctive feature of LEC is its Enterprise and Business Partnership (EBP) unit which hosts some 20 small companies working with LEC researchers and which has links to a large number of other national and multi-national businesses and organisations. We run both graduate and undergraduate consultancy programmes and have an extensive programme of knowledge innovation and transfer with both private and public sector partners.

Research and teaching in LEC is conducted by a community of colleagues with diverse backgrounds including: chemists, earth-atmospheric scientists, ecologists, geographers (human/physical), geophysicists, hydrologists, marine scientists, plant scientists and sociologists. Qualitative and quantitative approaches, spanning ethnography, in-depth interviews, large scale surveys, laboratory, field, modelling, policy and strong stakeholder/end-user engagement are all employed. Our four research challenges, Agri-Food, Eco-Innovation, Sustainable Catchments and Tropical Futures, provide a focus for our fundamental and applied research, ensuring our work helps provide the underlying knowledge needed to find effective solutions. Staff members work in multi-disciplinary research groups focusing on: Atmosphere, Climate and Pollution; Critical Geographies; Earth Science Ecology and Conservation; Environmental and Biochemistry; Geospatial Data Science; Plant and Crop Science; Political Ecology; Soil, Plant and Land Systems; and, Water Science.

LEC currently admits about 240 undergraduate students and 100 postgraduate (MSc/PhD) students each year and teaches across a wide range of degree schemes. Our teaching

methods range from small group discussions and lab based experiments to international fieldwork. In October 2016 LEC in collaboration with the Centre for Ecology and Hydrology (CEH) and Rothamsted Research launched a new 'Graduate School for the Environment'. This exciting collaboration aims to create a 'World-leading and distinctive entity for PG training, research and professional development', which will enhance our postgraduate activities.

LEC offers a highly inclusive and stimulating environment for career development. We are committed to family-friendly and flexible working policies on an individual basis, as well as the Athena SWAN Charter, which recognises and celebrates good employment practice undertaken to address gender equality in higher education and research.

The University

Lancaster is a world-class university with an international reputation for excellence in teaching, scholarship and research. Lancaster is ranked top ten in the Guardian League table and is consistently highly placed in all major league tables. Lancaster is the highest placed UK university in the Times Higher Education 100 Under 50 ranking of the world's best young universities. Lancaster is the highest ranked of only 14 UK universities to be listed. Established in 1964 Lancaster currently has over 12,000 students and has seen £450 million being invested in our campus since 2002. The University boasts an idyllic campus that combines city, coast and countryside all into one. The campus setting conveys a tranquil ambience whilst offering such a range of facilities it can almost be called a small town in its own right. The main Bailrigg campus is home to a range of amenities, and even its own cultural hub including a theatre, art gallery and concert series. More recently, Lancaster University has developed a portfolio of teaching partnerships overseas, as part of its global outreach internationalisation strategy.

Lancaster and the Region

The main campus lies 3 miles outside the City of Lancaster and is easily accessible via road, rail and bicycle. The city centre is just 15 minutes away by bus, and was recently ranked one of the top 10 most vibrant cities in the UK thanks to its arts scene and student population. The City of Lancaster also enjoys a long and diverse history dating as far back as 1193, and has a well-maintained iconic city centre and medieval castle. The campus is just 30 miles south of the beautiful Lake District and about the same distance from the Yorkshire Dales. It is very well connected by road and rail, with Manchester (and its international airport) just over an hour distant, while the train journey to London takes just two and a half hours.

Further information

Informal enquiries can be addressed to Professor Nick Ostle, n.ostle@lancaster.ac.uk