Department for Environment, Food and Rural Affairs

Defra's Science Advisory Council

# Membership

## Chair: Professor Rowland Kao

Professor of Veterinary Epidemiology and Data Science, University of Edinburgh.

Appointed January 2025. Previously served as a member from 2018 to 2024.

Rowland is a mathematical biologist who studies infectious disease dynamics, mainly with respect to the role of demography in the spread and persistence of infectious diseases in wildlife, humans and livestock. This work includes the development of theoretical models of disease transmission on social networks and applications to the transmission of livestock diseases using a range of analytical and simulation based techniques. An early proponent of the use of complexity science in infectious disease research, he also led some of the very first investigations that integrated epidemiological and bacterial sequence data, applying this approach to the problem of bovine Tuberculosis in British Cattle and Wildlife. He has since extended these approaches to a range of other pathogens. Rowland is also interested in the development of real-time parameter estimation techniques during the course of disease outbreaks. This research integrates demographic and spatial/geographic data for all large livestock and poultry in the UK, detailed information regarding the movements of livestock amongst agricultural premises and molecular epidemiology.

As such it integrates a wide variety of topics, most importantly the analysis of networks, but also elements of human behaviour (why do farmers move livestock the way they do, and what would happen if the conditions under which they moved livestock, changed), risk-based surveillance (can we use livestock movements and other forms of contact to identify individual farms most at risk of disease, and/or of transmitting it) and parameter inference (from observed disease data, can we estimate the relative and absolute importance of different routes of contact). Increasingly, the role of climate and land use change in the emergence of novel infectious disease problems is a feature of his work.

## Members

Our members are:

## Professor Richard Bardgett

Professor of Ecology at the University of Lancaster.

First appointed July 2021, reappointed July 2024 for 3 years.

Professor Bardgett's research explores how soils and their biodiversity shape the structure and functioning of terrestrial ecosystems and their response to land use and climate change. He is also interested in the practical implementation of soil ecological concepts for climate mitigation, ecosystem restoration, and sustainable management of soils.

His recent work is focused on ecological resilience and understanding how soil food webs and the biogeochemical cycles they regulate respond to and recover from climate extremes. His work also explores how vegetation and land use moderate soil responses to climate extremes and consequences for biogeochemical cycles.

Richard is Distinguished Professor in the Lancaster Environment Centre, Lancaster University, having recently moved from The University of Manchester, Department of Earth and Environmental Sciences.

He served as President of the British Ecological Society from 2017 to 2018, and co-founded the Global Soil Biodiversity Initiative in 2011 to promote translation of soil biodiversity knowledge into policy. He has served on several advisory boards, including BBSRCs Research Advisory Panel (2013 to 2018), the UK-SCAPE Programme Advisory Group (2021 to 2024), and Rothamsted Board of Directors (2009 to 2019), and recently Chaired BBSRC's Biodiversity Strategy Expert Working Group (2023 to 2024).

He was elected Honorary Fellow of the Royal Society of New Zealand in 2006, a Fellow of the Royal Society of Biology in 2011, and a Member Academia Europaea in 2015 for his pioneering contributions to soil ecology. In 2023, he was appointed Commander of the Order of the British Empire (CBE) for services to soil ecology and climate change science.

## Professor Nicola Beaumont

Head of Science for Sea and Society at the Plymouth Marine Laboratory.

Appointed February 2025 for 3 years.

Professor Nicola Beaumont leads the Sea and Society team at the Plymouth Marine Laboratory and is an internationally established expert in the assessment and valuation of marine biodiversity, ecosystem services and natural capital. She has honorary professorships at the School of Environmental Sciences, University of East Anglia, and the College of Life & Environmental Sciences, University of Exeter. Her

research spans scales from local to global, and a variety of environmental challenges, including: renewable energy, plastics, nitrogen pollution, flood and erosion management, climate change, ocean acidification, and marine planning and policy. Nicola has published more than 80 peer reviewed publications, and is an editor for the Journals of Environmental Economics and Policy, and Coastal Futures. Nicola has also published 20 plus influential reports, including for the UK Cabinet Office, the European Marine Board, Defra, and the Crown Estate. She has evidenced impact in the international policy sphere, and has contributed to a number of high level reports, including acting as the lead economist for marine and coastal margins for the UK National Ecosystem Assessment (NEA) and The Economics of Biodiversity: The Dasgupta Review.

Nicola has extensive project management experience and as lead investigator, she has secured and managed >£5 million of research funding, including leading three large (£1 million+) multi-institute collaborative projects, and including co-investigator roles, she has contributed to over 50 research projects. She has a particular interest in interdisciplinary research, and has written numerous guides and spoken extensively on this topic, providing both leadership and training in this area.

Nicola is skilled in research communication including working with academics, policy makers, managers and varied research user groups. She embraces outreach and media, including festival related STEM activities, YouTube, and interviews with radio, newspaper and television. Equality, Diversity and Inclusion (EDI) is of paramount importance to Nicola and she is experienced in the development and implementation of EDI strategies. As a senior academic Nicola draws on her people management skills to support and guide numerous teams, colleagues, and students, including formal and informal mentoring.

## Professor Camille Bonneaud

Professor of Evolutionary Ecology at the University of Exeter.

Appointed February 2025 for 3 years.

As an evolutionary ecologist, Professor Bonneaud specialises on host-pathogen interactions in animal systems, from the mechanistic underpinnings of co-evolution to the social and conservation implications of infectious outbreaks. Specifically, her work focussed on the emergence and spread of infectious pathogens across wildlife and agricultural animals, as well as on the development of animal epidemic preparedness programmes that engage local communities. To this end, she uses a range of model systems, including a bacterium of poultry that jumped into a wild North American songbird, avian pathogens across the Galápagos archipelago, leprosy in endangered West African chimpanzees, phocine distemper in seals of the UK, as well as anti-microbial resistant bacteria in wild birds. Her multidisciplinary

approach combines field and experimental work with molecular, immunological, and microbiological methods.

Prof Bonneaud is also the Director of the University of Exeter's Environment and Sustainability Institute. In this role, she supports the development of interdisciplinary and impactful research in sustainability, in consideration of the relationship between people and the environment and with a focus on biodiversity. She has worked in France and the USA, where she has received support from the EU, ANR and NSF. She also serves as an Associate Editor for Molecular Ecology and Molecular Ecology Resources.

## Professor Lisa Collins

Professor of Animal Science at the University of Surrey.

First appointed July 2021, reappointed July 2024 for 3 years.

Professor Lisa Collins is a biological scientist and interdisciplinary researcher with expertise in food systems resilience, regenerative agriculture, sustainability, and animal health and welfare. Her work focuses on developing smarter, healthier food systems through innovative approaches such as systems modelling, data analytics, and advanced technology applications.

Professor Collins led the National Pig Centre, a national research facility at the University of Leeds from 2019 to 2023, where she was Director of Commercial Research for the Global Food and Environment Institute. She has received over £14m of research grant funding and has led several significant research projects, including the "PigSustain" project, which examined the resilience of the UK pig industry to challenges such as emerging infectious diseases and workforce dynamics. She currently leads a key workstream within the £7M UKRI "FixOurFood" program, investigating regenerative agriculture practices and their impacts on soil health, emissions, and biodiversity.

In addition to sitting as a member of the Defra Science Advisory Council (since 2021) and the Scottish Government's Rural and Environment Science and Analytical Services Science Committee (since 2022), she chairs the BBSRC's Strategic Advisory Panel on Biosciences for the Integrated Understanding of Health (since 2024). Professor Collins holds Fellowships with the Learned Society of Wales, Royal Society of Biology, and Royal Statistical Society, served as a Trustee and Board member of the Sustainable Aquaculture Innovation Centre (2022-24) and regularly serves on numerous UKRI assessment panels, including as a chair for the UKRI Cross Research Council Responsive Mode panels (since 2024) and as a core member of BBSRC committee E (fellowships) since 2019.

An award-winning science communicator and committed to public engagement, Professor Collins has delivered events across the UK, and champions bringing an evidence-based and collaborative approach to addressing complex real-world issues. In her role as Pro Vice Chancellor for Research and Innovation at the University of Surrey, Professor Collins has responsibility for the University's research and innovation ecosystem, including research strategy, integrity and governance, and culture, innovation and commercialisation, research partnerships and regional development.

## Professor Felix Eigenbrod

Professor of Applied Spatial Ecology, in Geography and Environmental Science at the University of Southampton.

First appointed February 2022, reappointed January 2025 for 3 years.

Professor Eigenbrod is a landscape ecologist by training, he mostly works with existing socio-economic and ecological spatial datasets to understand relationships between biodiversity, society, and ecosystem services, and at identifying the spatial and temporal scales at which trade-offs and interactions occur. His work is highly interdisciplinary, with recent work looking among other things at environment-energy interactions, mental health implications of greenspace, and the impacts of climate change on food crops. He has a particular interest in developing new approaches for predicting and understanding socio-ecological phenomena such as land use change and where nature-based solutions are most effective.

Felix was awarded an ERC Starting Grant ("Scaling Rules for Ecosystem Services") and has received funding from NERC and EPSRC. He was also the co-convenor of a series of workshops in 2019 and 2020 on developing new mathematical methods for landscape decisions at the Isaac Newton Institute in Cambridge funded directly by NERC.

## Professor Nicholas Hanley

Professor of Environmental and One Health Economics, School of Biodiversity, One Health and Veterinary Medicine, University of Glasgow.

First appointed July 2021, reappointed July 2024 for 3 years.

Professor Hanley joined the University of Glasgow in December 2017, having previously held chairs at the universities of Stirling, Edinburgh and St Andrews. He is an environmental economist who mainly works on the application of economic methods (including behavioural economics) to biodiversity conservation, nature

markets, and measures of sustainability. He is also interested in choice modelling and cost-benefit analysis; marine systems; the design of environmental policy (especially Payment for Ecosystem Service schemes); and ecological-economic modelling. He is an Associate Editor of Resource and Energy Economics, and an Editor of Ecological Economics.

## Professor Chris Hauton

Professor of Marine Ecophysiology, Head of School, Ocean and Earth Science, University of Southampton.

Appointed February 2025 for 3 years.

Prof Chris Hauton FRSB FMBA has broad research interests in the fields of invertebrate physiology and immune function. His applied research includes studies of shellfish aquaculture and shellfish restoration, both in the UK and through Asia, on decapod crustaceans, molluscs, and some fish species. More recently he has also developed expertise in the toxic risks of deep-sea mining. His research encompasses all levels of biological organization from molecular studies of gene expression to assays of whole organism physiology. Whilst most work in his group is conducted as controlled laboratory experiments, they have also worked on shellfish projects through the UK and Asia in situ in shallow waters using scuba, and also on projects at bathyal and abyssal depths in the North Atlantic, Antarctic and Pacific.

## Professor Jane K Hill OBE

Professor and Associate Dean for Research in the Faculty of Sciences, University of York

Appointed February 2025 for 3 years.

Jane is a terrestrial ecologist, researching how species (particularly insects) respond to climate change and habitat degradation. This research includes understanding the causes and consequences of biodiversity change, as well as examining the complexity of change, including species gains and losses. This research examines factors affecting the rates of species' range shifts to track climate, including factors affecting range expansions and extinctions of local populations. Jane's research also examines the effectiveness of conservation actions to protect and enhance biodiversity, for example identifying when and how improving habitat connectivity is beneficial for species. Much of this ecological research focuses on the UK, but Jane also studies tropical ecosystems.

For the past 30+ years, Jane has been examining the impacts of tropical forest loss and degradation on biodiversity in South East Asia. She examines the responses of tropical biodiversity to climate change, and the consequences of commercial logging and agricultural development (palm oil) on biodiversity. The research has tested the impacts of environmental sustainability standards, and provided policy recommendations for protecting biodiversity to better inform land management. Jane is a member of the UK Research and Innovation (UKRI) Natural Environment Research Council's Science Committee, current President and Trustee of the Royal Entomological Society, and trustee of the South East Asian Rainforest Research Partnership. She gave evidence to a House of Lord's committee inquiry (2023) on protected areas, was a panel member of the independent review of protected site management on Dartmoor (Defra Fursdon report 2023), and is a member of Yorkshire Wildlife Trust's Nature Recovery Committee and the North Yorkshire and York Local Nature Partnership Board.

## Professor Susan Owens

Emeritus Professor of Environment and Policy and Fellow Emerita of Newnham College, University of Cambridge.

First appointed July 2021, reappointed July 2024 for 3 years.

Professor Owens is a Fellow of the British Academy and of the Academy of Social Sciences. Her research lies in the field of environmental governance, focusing on policy processes in modern democracies and the role of evidence and expertise in policy formation and change. Her most recent book, Knowledge, Policy, and Expertise (OUP 2015), provides an in-depth analysis of the practices and influence of the former Royal Commission on Environmental Pollution (RCEP, 1970 to 2011), as well as addressing wider questions about knowledge–policy interactions. She was co-author of the 2019 SAPEA (Science Advice for Policy by the European Academies) Evidence Review, Making Sense of Science for Policy under Conditions of Complexity and Uncertainty. In 2008–9 she held the King Carl XVI Gustaf Professorship of Environmental Science, and was hosted by the Stockholm Resilience Centre and the Royal Institute of Technology (KTH), Stockholm.

Susan has been chair of the Social Science Expert Group (Defra SAC sub-group) since 2021. Currently she is a member of the Public Policy Committee of the British Academy; the Evidence Advisory Committee, Natural Resources Wales; the Board of the Parliamentary Office of Science and Technology (POST); and the Management Board of the University of Cambridge Centre for the Study of Existential Risk. She also chairs the Advisory Board for the ESRC-funded ACCESS Programme (Advancing Climate Change and Environmental Social Science). Previously she chaired the Science Advisory Council of the Stockholm Environment

Institute (2005 to 2024) and has been a member of the Independent Review Panel on Highly Protected Marine Areas (Benyon Review, published June 2020); Defra's Hazardous Substances Advisory Committee (2013 to 2022); the Royal Commission on Environmental Pollution (1998 to 2008); and the Science Policy Advisory Group of the Royal Society (2008 to 13).

## Professor Marian Scott

Professor of Environmental Statistics, School of Mathematics and Statistics, University of Glasgow and elected fellow of the Royal Society of Edinburgh and the International Statistics Institute.

First appointed June 2022, reappointed in 2025 for 3 years.

Professor of Environmental Statistics, School of Mathematics and Statistics, University of Glasgow and elected fellow of the Royal Society of Edinburgh and the International Statistics Institute. A chartered statistician of the Royal Statistical Society. Her research lies firmly in applied Statistics, with specific interests in the environment, (past, present and future), archaeology and animal welfare. The Chair of the EU Scientific Committee on Health, Environment and Emerging Risk, and a member of the NatureScot Science Advisory Committee, and the NERC science committee. In 2009, she was awarded an OBE for services to science. She was awarded the RSE Kelvin medal in 2024.

Date of document (February 2025)