

## Professor James Bullock

### *Conservation Ecologist, Centre for Ecology & Hydrology*

James Bullock's PhD on plant competition involved "lots of very tedious work measuring grass shoots, weighing them, entering data and analysing it". Yet even these simple greenhouse experiments revealed the awesome complexity of nature.

"You read these grand theories of things, but real life is much more complicated," says James. "Actually getting out there and doing it, and collecting my own data, showed how difficult it is to apply theory to something as complicated as ecology."



James went on to do a post-doc and then to work at the Centre for Ecology & Hydrology, where he now leads research tackling some of today's most critical ecological problems, stemming from the need to maintain a healthy and diverse ecosystem in the face of growing demands for food, water, housing and transport.

His work covers habitat restoration, control of invasive species, ecological farming and valuing nature. These topics can be controversial – for example, there is a heated debate over whether it is possible or even desirable to put a value on nature. There are also conflicts between different stakeholders – farmers, local residents, conservationists, fishermen and tourists – and trade-offs between different objectives such as biodiversity, water supply, carbon storage and food production.

"Conservationists assume everyone wants more pretty flowers", James explains, "but actually there are tensions between landscape, nature, cheap food, quick travel and so on. We're working a lot with social scientists – becoming more and more multidisciplinary, which is very exciting".

James draws on the rigorous approach that was instilled during his PhD training to make sense of these complex issues using objective, evidence-based analysis. Knowing how complex the natural world is, he rejects easy answers, such as the assumption that what's good for biodiversity will also be good for other ecosystem services.



James (left) planning fieldwork on Salisbury plain

"My issue is whether the story is quite as neat as that – whether managing for clean water or carbon sequestration is the same as managing for biodiversity" he says. For example, planting trees on grassland could increase carbon storage, thus helping to reduce climate change, but if non-native species are used then there could be negative impacts on biodiversity. "If you have a narrow approach you could get conflicts," explains James. "I'm arguing that we need to think about a range of things and find the best compromise."

His reputation for rigorous, science-based analysis makes him a trusted source of advice for policy makers. For example, a study showing that creeping thistle – a highly invasive farmland weed – can be controlled through carefully managed grazing instead of by spraying harmful herbicides, fed directly into Defra guidance for farmers on agri-environment schemes.

“It’s satisfying that you see a practical outcome very rapidly,” says James. “Defra come to people like us with a problem and we propose an experimental or modelling approach to get new evidence that you can use. Directly as a result of our research, Defra fund a new option for enhancing plant diversity on productive grasslands – planting pollen and nectar-rich species for bees to help with pollination.”

James was a lead author on the ground-breaking National Ecosystem Assessment. This is a comprehensive study showing that nature provides services such as clean air and water, pollination and natural pest control that are worth billions of pounds to the UK economy, as well as important and often-overlooked cultural and aesthetic benefits. The study has already been integrated into UK government policy, and is having a major international influence.

He led the chapter on semi-natural grasslands, which showed that wildlife-friendly farming methods avoiding the use of fertilisers and pesticides also increase carbon storage in the soil, reduce air and water pollution and help prevent floods by increasing water penetration into the soil.

“If we manage our ecosystems appropriately we won’t just help biodiversity – we’ll also enhance all these ecosystem services for the good of society as a whole” he says.

### **Career timeline**

1983-86	BSc Biology, Imperial College
1986-89	NERC-funded PhD, Liverpool – Plant competition
1989-93	Post doc, Open University
1993-present	CEH

### **More information**

James Bullock at CEH [www.ceh.ac.uk/StaffWebPages/ProfessorJamesBullock.html](http://www.ceh.ac.uk/StaffWebPages/ProfessorJamesBullock.html)

National Ecosystem Assessment <http://uknea.unep-wcmc.org/>

Wessex-BESS [www.brc.ac.uk/wessexbess/](http://www.brc.ac.uk/wessexbess/)